**Win An Indus Disk Drive!** See Page 6.

#1 Atari Computer Magazine

U.S.A. $3.50
CANADA $4.00

# Antic®

## The ATARI® Resource

JANUARY 1985 VOLUME 3, NUMBER 9




## SUPER UTILITIES

**5 SUPER UTILITY PROGRAMS plus**

**Unlock XL Parallel Bus!**

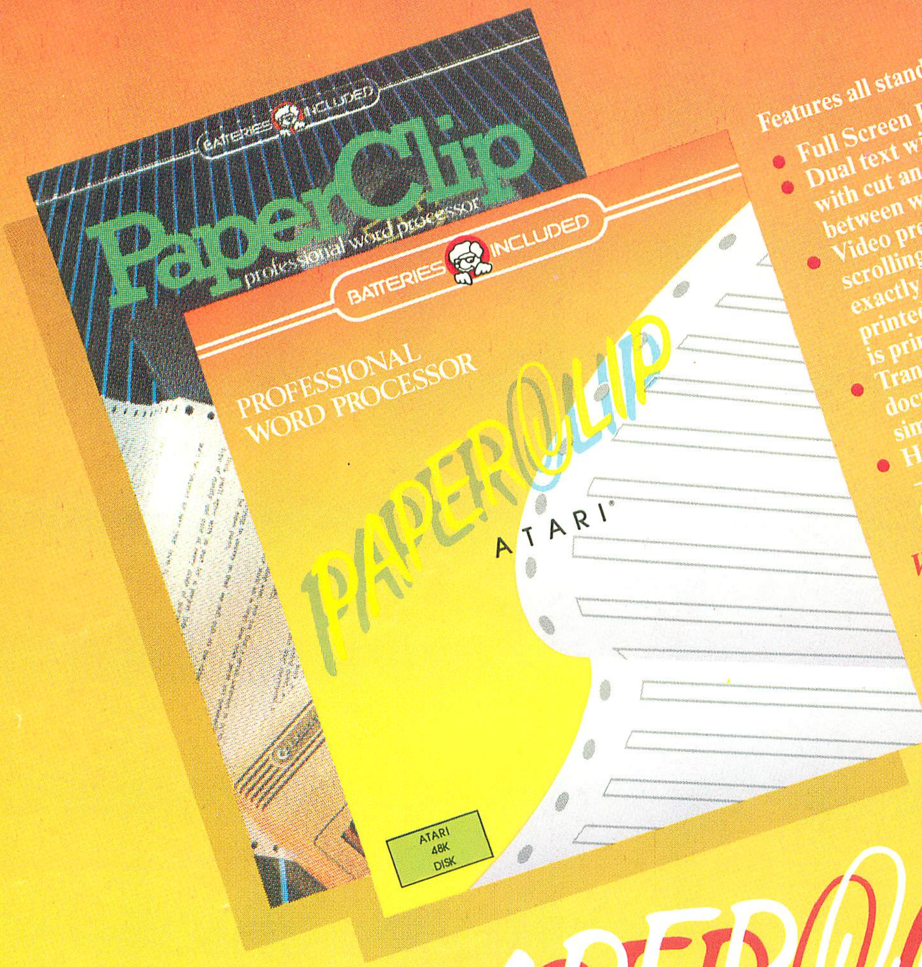
**New, Easier TYPO II**

**2 Type-In Games**

**Color The Cover!** See page 6.

# WHEN BATTERIES INCLUDED SET OUT TO DESIGN THE VERY BEST WORD PROCESSOR FOR ATARI® COMPUTERS... THEY FOUND THEY ALREADY HAD IT.

FOR COMMODORE AND ATARI




Features all standard word processing functions PLUS

- Full Screen Editing
- Dual text windows with cut and paste between windows.
- Video preview with scrolling, lets you see exactly what will be printed, *before* it is printed
- Transfer text between documents – easily, simply
- Horizontal scrolling – create wide documents with ease
- Re-arrange words, phrases, sentences, paragraphs, and columns with just a few keystrokes
- More than 40 different printer drivers – plus printer editor allows programming for any conceivable new printer
- Easy to learn, easy to use

**WORKS WITH THE NEW ATARI B.I. 80 COLUMN DISPLAY ADAPTOR FOR XL SYSTEMS.**

Compatible with Atari 400, 800, 600 XL, 800 XL, 1200 XL

# PAPER CLIP
ATARI®

*Few word processors have allowed Atari users to tap the full resources of their computer* ***until Atari Paper Clip****...*
*Atari Paper Clip is an extremely powerful, fully featured word processor that will allow your Atari to operate to the limits of its potential, with an ease of operation and speed you've never thought possible.*

**PAPER CLIP FOR ATARI® AND COMMODORE® OWNERS WHO WANT THE VERY BEST IN WORD PROCESSING.**

**BATTERIES INCLUDED**

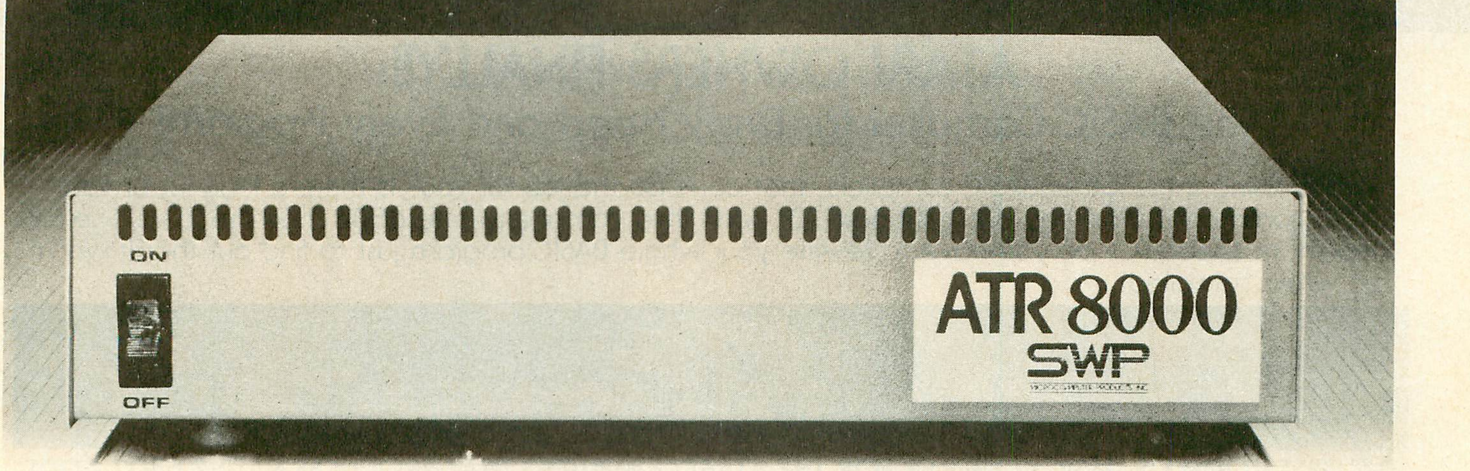
"The Energized Software Company!"


186 Queen St. West
Toronto, Ontario,
M5V 1Z1 Canada
(416) 596-1405

17875 Sky Park North,
Suite P, Irvine, California
USA 92714


FOR A FULL COLOR BROCHURE SEND A STAMPED SELF-ADDRESSED #10 ENVELOPE TO BATTERIES INCLUDED.

# CP/M and MS-DOS Compatibility For All Atari Computers




*"A fine CP/M machine . . . the ATR8000 closes the gap that has separated Atari owners from the rest of the software market."*

—*Byte Magazine*

## CP/M compatability for your Atari — only from SWP.

Now you can run CP/M programs on your Atari 400, 800, 1200 and XL series computers.

The ATR8000 from SWP Microcomputer Products is a 4MHz, 16k RAM complete Atari interface. When you add the optional 64k RAM, the ATR8000 will run CP/M!

**The ATR8000 features:**

- 64k RAM
- RS-232 port with software to run a serial printer or modem.
- The ability to run up to four 5 1/4" or 8 " drives of any mixture, type and density (MY-DOS is optional and is used for double density Atari operations).
- Double density CP/M 2.2.
- 80 column wide display with 40 column moveable window. Or an optional 80 column software (AUTOTERM-80) program that can be used with a black & white TV or monitor.

When you order your ATR8000, you'll not only receive the hardware and software you need, but also an easy to read owner's manual and CP/M supplement that will take you into the exciting world of CP/M.

SWP

MICROCOMPUTER PRODUCTS, INC.

2500 E. Randol Mill Rd., Suite 125, Arlington, TX 76011

**Add MS-DOS compatibility too!**

An Atari that runs MS-DOS, IBM-PC software?

By adding CO-POWER-88, our own 8088 co-procesor to your ATR8000, you can also run most of the popular MS-DOS, IBM-PC software.

The CO-POWER-88 is a 16 bit, 5.33 MHz, 8088 co-processor with 128k or 256k RAM. It comes complete with MS-DOS and RAM disk software. CP/M-86 is available as an option.

More than just a co-processor, its RAM can also be used as a high speed simulated disk drive for CP/M.

Installation is simple. Your CO-POWER-88 comes with the Z-80 adaptor board and main processor board. You'll also receive a complete owner's manual and easy-to-follow instructions.

**CP/M and MS-DOS, IBM-PC compatibility for your Atari can now be yours.**

Contact your local SWP dealer or order direct by mail. Better yet, for fastest delivery, use your credit card and shop by phone.

**Credit Card Orders Save Time!**
**Call 817-469-1181 or 817-861-0421 And Order Now**
**Or Mail Coupon to: SWP, 2500 E. Randol Mill Rd., Suite 125, Arlington, TX 76011**

**Please ship the following:**

☐ 16k ATR8000 Atari Interface@$450.00 + $10.00 shipping.
☐ 64k ATR8000 w/CP/M@$599.95 + $10.00 shipping.
☐ 128k CO-POWER-88 with MS-DOS@$400.00 + $10.00 shipping.*
☐ 256k CO-POWER-88 WITH MS-DOS@$500.00 + shipping.*
☐ CP/M 86 (16-bit Disk Operating System)@$70.00 + $5.00 shipping.
☐ MY-DOS (Atari-like Disk Operating System)@$29.95 + $2.00 shipping.
☐ AUTOTERM-80 (80 column display for CP/M or MS-DOS)@$29.95 + $2.00 shipping.
* Must be used with 64k ATR8000.

Specify Atari model computer you own: ____________
Configurations: (check one) 5 1/4" drive ____ or 8" drive ____

☐ I want to learn more about the ATR8000 and CO-POWER-88. Enclosed is $1.00 (cash only) for more literature, including a comprehensive listing of MS-DOS and CP/M-86 software that runs on the CO-POWER-88.

**Method of payment:**

☐ Personal Check enclosed (must clear bank before shipping)
☐ Certified Check or Money Order enclosed.
☐ Charge the following credit card:
☐ Master Card ☐ Visa
Credit Card # ____________
Master Card Bank # ____________ Exp. Date ________
Subtotal: ________ + Shipping ________ + Sales Tax (Texas Residents add 5%) ________ =
Total Enclosed: ________
Name ____________
Address ____________
City ________ State ________ Zip ________
Phone (h) (____)____-____ (w) (____)____-____

Signature ____________

# THE MMG BASIC COMPILER

## ATARI OWNERS FINALLY!!

### The BASIC Compiler for Every Need and Every Program!

Tired of using those other BASIC compilers that don't do the job for you? Is there a long list of valid BASIC commands that they don't support? Or don't they compile to true 6502 machine language for maximum speed? Or do you have to rewrite your whole BASIC program just to find out that it won't run when compiled?

## Announcing THE MMG BASIC COMPILER

**THE FIRST COMPLETE BASIC COMPILER FOR THE ATARI COMPUTERS THAT PRODUCES NATIVE 6502 CODE**

### What is a BASIC compiler?

BASIC, as we all know, is an easy-to-use language for ATARI computers. It's only disadvantage is that it's SLOW. For some types of functions, it seems to take BASIC programs forever to execute. We all know that the fastest language available is machine language, the language of ones and zeros. But don't worry! Now you don't have to learn a whole new language just to have programs execute with machine language speed.

The MMG BASIC COMPILER takes your BASIC program and converts it to machine language for you. Furthermore, this machine language program will autorun, simply by naming it AUTORUN.SYS, putting it on a disk with the DOS 2.0S files on it, and turning on your computer with that disk in your drive.

### What will a compiler do for me?

Using the MMG BASIC COMPILER, you can program in BASIC, the same BASIC you already know, and get your program up and running. Then the MMG BASIC COMPILER will convert your BASIC program for you, producing lightning-fast programs to rival those of the professionals. Imagine moving a player from the top of the screen to the bottom in less than a second! Try that using other compilers! Imagine what your programs will be like when they're compiled to true 6502 machine language. The MMG BASIC COMPILER has been used to produce commercially available arcade-type games from BASIC source code, and can do the same for you!

MMG would even be interested in marketing your results! If you produce what you believe to be a marketable program, call us for details!

### Can your compiler:

- compile to fast 6502 machine language, not slow pseudocode (P-code)?
- support trigonometric functions like ATN, COS, SIN?
- support mathematical functions like CLOG, EXP, LOG, RND, SQR?
- support RUN "D:PROGRAM"?
- support ATARI string handling like A$(2,4)="BOD"?
- support COMmon variables?
- support the POP command?
- support the LPRINT command?
- support either RAD or DEG calculations?
- support both integer and floating point arithmetic?
- operate in either single or true double density?
- allow DATA statements anywhere in your program?
- produce assembly language source code of your program for your own use?

The MMG BASIC COMPILER does!

**The MMG BASIC COMPILER comes with both single and double density versions on the same disk, and is available from your local computer store, or send $99.95 plus $3.00 for shipping and handling to:**

**MMG Micro Software P.O. Box 131 Marlboro, NJ 07746 (201) 431-3472**

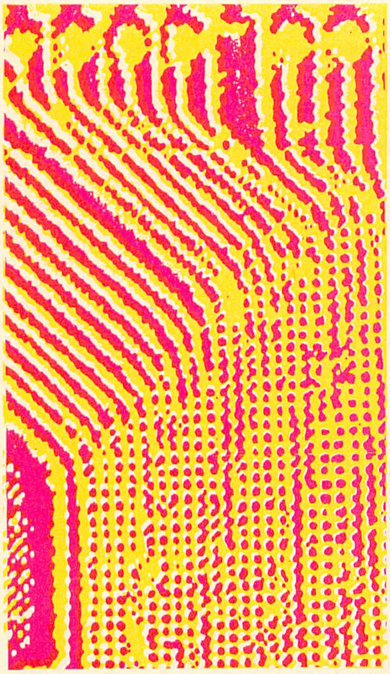
Visa, MasterCard, or COD orders accepted. New Jersey residents please add 6% sales tax.

# Antic®

The ATARI® Resource JANUARY 1985, VOLUME 3, NUMBER 9



Microscreens look to the future ....... 8



Rapid transit with the parallel bus ..... 44



Wildlife conservation, Antic style!...... 30

## FEATURES



## DEPARTMENTS



## SOFTWARE LIBRARY

Antic
The ATARI Resource

Publisher
James Capparell

Editorial Department
Nat Friedland, Editor
Jack Powell, Technical Editor
Michael Ciraolo, Staff Writer
Charles Jackson, Staff Writer
Melissa Rockliff, Editorial Coordinator

Contributing Editors
Carl Evans, Ken Harms
Jerry White, Suzi Subeck
Anita Malnig

Art Department
Marni Tapscott, Art Director
Kyle Bogertman, Production Supervisor
Linda Tapscott, Ad Production Coordinator
Patricia Fostar, Production Assistant

Cover Artist
Pete McDonnell

Circulation Department
Les Torok, Manager
Peter Walsh, Shipping
Hun-sik Kim, Shipping
Monica Burrell, Subscriptions
Eve Gowdey, Dealer Sales
Doug Millison, Retailer Sales

Accounting Department
V.J. Briggs, Manager
Brenda Oliver, Accounts Receivable
Lorene Kaatz, Credit Manager

Marketing
Gary Yost, Manager, Marketing Support
Steve Randall, Advertising Sales Director

Maria E. Chavez, Receptionist

*General Offices (415) 957-0886*
*Advertising Sales (415) 661-3400*
*Credit Card Subscriptions*
*outside California (800) 227-1617 ext. 133*
*inside California (800) 772-3545 ext. 133*
*Subscription Problems (415) 397-1881*

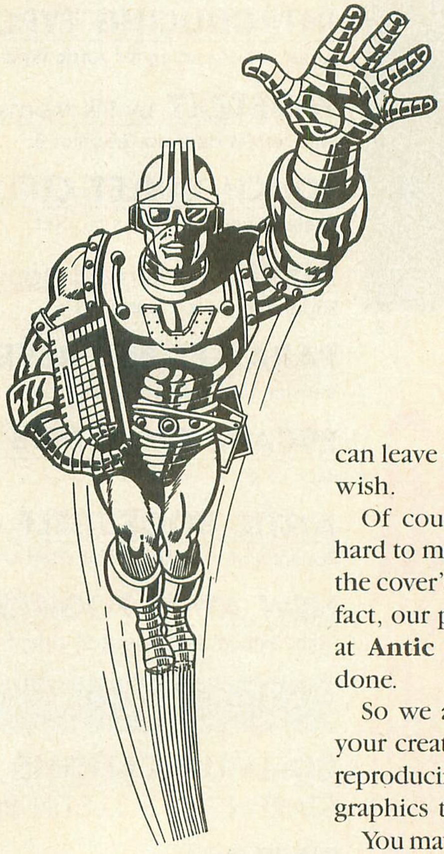
January 1985
Volume 3, Number 9
**ANTIC**—The ATARI Resource is published twelve times per year by Antic Publishing. Editorial offices are located at 524 Second Street, San Francisco, CA 94107. ISSN 0745-2527. Second Class Postage paid at San Francisco, California and additional mailing offices. POSTMASTER: Send address change to **Antic**, 524 Second Street, San Francisco, CA 94107.

Editorial submissions should include program listing on disk or cassette, and text file on media and paper if text was prepared with a word processor. Media will be returned if self-addressed stamped mailer is supplied. **Antic** assumes no responsibility for unsolicited editorial material.



# COLOR THE COVER

## Win a $499. Disk Drive



As you probably noticed, this month's cover is missing something . . . color. We decided to leave the coloring to you, for once.

This is your invitation to enter **Antic's Color The Cover Contest** and possibly win an Indus GT disk drive list-priced at $499.99. Send in a disk or cassette of your color rendition of the January **Antic** cover.

We're keeping the rules simple: You must use your Atari to reproduce the form and spirit of the cover drawing. Any Atari-compatible graphics hardware and software is eligible. You can reposition Super Utility Man to fit better across your video screen. And you can leave out all the cover text if you wish.

Of course, we recognize that it's hard to match the detailed quality of the cover's line art with your Atari. In fact, our publisher was the only one at **Antic** who thought it could be done.

So we are challenging you to use your creativity and come as close to reproducing the artwork as computer graphics technology allows.

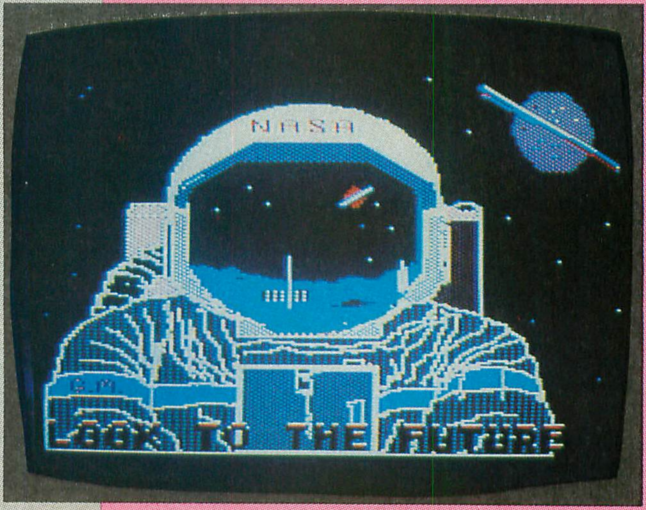
You may work alone or collaborate with friends and family. Enter as many colorings as you want. But all entries must be received at **Antic** by February 1, 1985.

Be sure to send loading instructions along with your disk or cassette—plus a short note telling about yourself and your computer graphics tools.

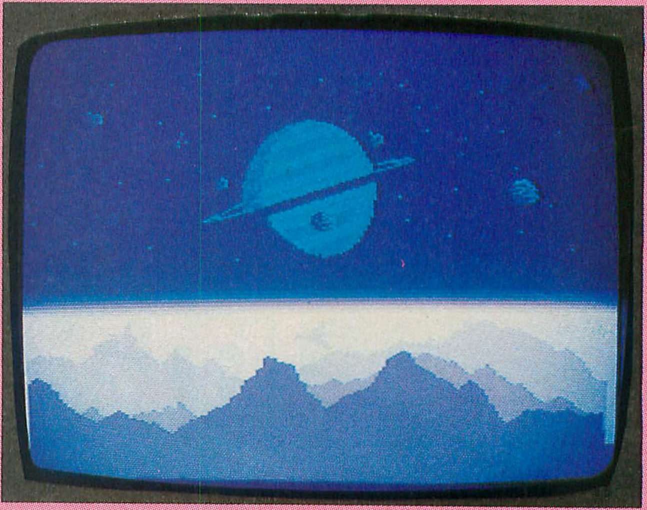
The winning and runner-up microscreens will appear in the June, 1985 **Antic**. First prize is an Indus GT disk drive. Second and third prize are Antic T-shirts. All entries become the property of Antic Publishing, Inc. and will not be returned. Contest is void where prohibited.

Mail your entries to:
**Color The Cover**
**Antic Magazine**
**524 Second St.**
**San Francisco, CA 94107.**

# microscreens




Outer space is the theme for two of this month's **Antic** microscreens. G. Manson of Sparks, Nevada presents a mysterious astronaut in "NASA".



San Franciscan Michael Green's ethereal "Moonview" was created using "Fun With Art" software.

We're not sure if our third microsceen, "Buddah" is supposed to be a scene from another planet or another dimension. Steven Dong, a medical school senior at the University of Texas, San Antonio, used up "valuable sleep time" to draw this with his Atari Touch Tablet.




If we publish your Atari computer art on our microscreens page, you get an Antic T-shirt. Send your pictures to **Antic** on disk or cassette with stamped self-addressed return envelope. Write loading instructions on a short note telling about yourself and which graphics tools you use . . . also include two choices of T-shirt size and color.

# *LOTSABYTES* DECLARES WAR !

**WAR** on high prices ! We're going to put an end to the software price 'ripoff'. And **YOU** can help ! Just keep those orders coming while you continue to enjoy the **quality, quantity, selection** and **low prices** that you deserve. Our National Public Domain Copy Service will save you time, tedious work, and money. And our **exclusive** distribution of **sharply discounted** commercial programs will bring you some of the finest programs for the lowest possible price, usually 50% off retail! You continue to get **FREE BONUSES** with each purchase of three or more disks.

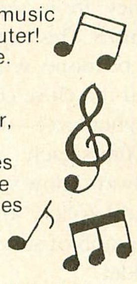
## *PUBLIC DOMAIN SOFTWARE*

| #1 GAMES | #2 UTILITIES | #3 AMS MUSIC | #4 GAMES | #5 EDUCATION |
|---|---|---|---|---|
| Two full disk sides packed with over 25 games including some Arcade quality. **$7.95** | 25 powerful programs to help you get the most out of your Atari computer. **$7.95** | 25 Advanced Musicsystem files including a new Player program. 2 sides. **$7.95** | All different ! 14 more better games on 2 disk sides. Some Arcade types. **$7.95** | Loaded with 28 programs on 2 disk sides Fun learning for the whole family. **$7.95** |
| **#6 AMS MUSIC** | **#7 GAMES** | **#8 UTILITIES** | **#9 GAMES** | **#10 UTILITIES** |
| 25 all-time favorites with a Player program. Two sides. **$7.95** | Two disk sides packed with 14 more great games. Some Arcade types. **$7.95** | 17 more power-packed utilities to help unleash the full potential of your Atari. **$7.95** | *NEW !* Two full sides filled with some of the best and most recent. Some Arcade. **$7.95** | *NEW !* A new assortment of great and powerful programs. Don't miss it ! **$7.95** |

## *LotsaBytes EXCLUSIVES*

### ADVANCED MUSICSYSTEM II
*by LEE ACTOR*

Allows you to create music with your Atari computer! All new machine code.

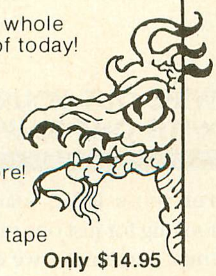


* Control over pitch duration, envelope dynamic level, meter, tempo and key.
* 4 independent voices
* 5½ octaves per voice
* Save up to 8200 notes
* Custom DOS
* FULL instructions
* 24K disk

*Originally $29.95* **Only $14.95**

### ORIGINAL ADVENTURE
*by Bob Howell*

For all Atari computers. The Original Colossal Cave Adventure faithfully reproduced from the 'main-frames'. This is the one that launched the whole Adventure craze of today!



* Two mazes
* 130 rooms
* Deadly Dragons
* Nasty Dwarves
* Tenacious Troll
* The Pirate & More!
* 86 coded hints
* SAVE/RESUME
* 40K disk or 32K tape

*Originally $29.95* **Only $14.95**

### *QUALITY WORD PROCESSING*

**ESI WRITER !** At last a brand-new Word Processor that has more features and is easier to use than anything else available for the Atari. Easy for the beginner to use, it asks questions and remembers the answers. ESI WRITER is so sophisticated that it has many more features we don't even have room to mention ! Works with ANY Atari.

* Reads any text file
* Built in Help screen
* Very fast !
* Works with ANY printer
* Instant top, bottom or text location without scrolling!
* Every printer feature
* DISK ONLY (Any Atari)
* Search and replace
* Block move text
* Page eject/start
* Set margins/lines etc.
* Full justification
* Print headers etc.
* Block delete etc.
* Change video color
* Over 50 pages of docs and tutorials

*TRUST US ON THIS ONE ! YOU WILL LOVE IT !*

*Originally $49.95* ***LotsaBytes* price $24.95**

### * * FREE BONUSES * *

If you purchase any 3 or more disks at a time you may choose any 1 of the following disks **FREE !!**

**a.** The Atari XL TRANSLATOR DISK that enables XL owners to use most 400/800 software. **FREE !!**

-- or --

**b.** An all different AMS MUSIC disk with Player. **FREE !!**

--or --

**c.** Your choice of one of the P.D. disks -- #1, #2, #3, #4, #5, #6, #7, #8, #9, or #10 (specify one) **FREE !!**

## GREAT GAMES !
### *LotsaBytes Exclusives !*

**SPACE GAMES:** Three games for **one** low price!. In **Aliens** you can't get them all and the pace keeps getting faster. When you do get rid of most of them, you are left in a space quadrant peppered with mines. Will you **Survive**? If you do, you must penetrate the alien's spaceship, survive a **Robot Attack**, and get back your stolen 'cloaking' device! Interested?

*$24.95 list*

***LotsaBytes price:* $12.95**

**THE BEAN MACHINE** by Steve Robinson is an Award Winning Arcade game that will drive you crazy balancing a series of beams while trying to get all the beans to roll down, without touching, all the while avoiding 'strange creatures' who drop in to steal the beans. It's addicting!

*$24.95 list*

***LotsaBytes price:* $12.95**

**DIGGERBONK**, another Award Winning game by Steve Robinson, challenges you to find your way through a continuously scrolling maze while avoiding some really strange creatures. Along the way you will need to Bonk some of them, but watch out for the bombs.

*$24.95 list*

***LotsaBytes price:* $12.95**

**GUESS WHAT'S COMING TO DINNER** lets you try to manuever a snake through 7 levels if you can keep it from starving or being electrocuted. Lots of surprises! One or two players.

*$24.95 list*

***LotsaBytes price:* $12.95**

* * * *

## CREATIVE LEARNING ADVENTURES
### *Ages 4 to 10 — Disk only*

**1.** Hours of **educational** fun playing 3 exciting creative adventures with a friendly alien learning about our planet Earth. Hand/eye co-ordination, drawing, and music skills are emphasized.

*$24.95 list*

***LotsaBytes price:* $12.95**

**2.** Four challenging learning games that are the favorites of our friendly alien. Helps your child to develop logical reasoning ability.

*$24.94 list*

***LotsaBytes price:* $12.95**

**3.** These 3 Fun-Day learning games will help with intellectual development, hand/eye co-ordination, logic, spatial, and analytical abilities.

*$24.95 list*

***LotsaBytes price:* $12.95**

Full 100% Replacement guarantee.Any disk found to be defective will be replaced free and we will also refund your return postage. All orders shipped by First Class U.S. Mail. Add $1.95 shipping and handling for 1to 5 disks. Add $2.95 for 6 to 12 disks. California residents add 6% sales tax. Outside of U.S.A. and Canada add 15%. U.S. Funds only. We accept checks or Money Orders. Sorry, no COD or Charge Cards. Allow three weeks for personal checks to clear.

**LOTSABYTES**

**15445 Ventura Blvd., Suite 10G**
**Sherman Oaks, CA 91413**

# i/o board

## HELP US HELP YOU

I want to praise **Antic** for having the brains to publish "Brain Research with the Atari." I was sure an article like this would have been considered of too limited interest to have been published. Personally, I'd like to hear more about constructive uses of the Atari. I'm tired of games. Why can't your magazine offer a wider spectrum of articles?

Chuck Smithson
Reno, NV

*We want to be of use to our readers. The only way we can be of use is to know what readers want to see,and the best way to communicate this is to write us.*
—ANTIC ED

## CURING COLOR DISTORTION

I have a problem with my BMC color monitor: distortion is caused when I use the RF modulator and my Atari. Contrasting colors aren't sharp, but often bleed several pixels to the right or cast shadows. Even in BASIC, using the default colors, characters cast a shadow about one-third the character width, to the right.

I sent the computer to Atari and they said it was a problem with the 1200XL. When they were done, it was "fixed," several changes had been made in the computer, and the problem still exists. Calling back, I was told they did not know how to fix it. Can you help me?

Michael Rutheford
Houston, TX

*We're passing this along to you, our readers. If anyone has a solution, or ideas, let us know.* —ANTIC ED

## I/O ODDITY

When I work in immediate mode and I write

POKE 710,0: POKE 709,9:
LOAD "D:FILE.EXT"

I hear the loading program sound before the screen turns black. Why?

Ivan Antezana
Lima, Peru

*Every 1/30th of a second, during the stage two vertical blank interval, certain registers in the operating system (OS) in ROM look into related registers in RAM and steal the values for their own use. The RAM registers are called shadow registers to the ROM registers. In the case of your program line, 709 and 710 are shadow registers for locations 53271 and 53272. The program line is being processed so fast by BASIC that it begins execution of the file I/O before the OS registers can get the new color values from the shadow registers. During I/O, the Critical I/O Region Flag at location 66 is set, which suspends the vertical blank transfer process, and the ROM registers have to wait to get their new colors. If you add just the slightest delay after the two POKEs in your line, (such as PRINT CLOG(8)) the registers will have the time to transfer colors and your screen will change before the drive runs.* —ANTIC ED

## RIBBON RESURRECTION

A tip for Atari 1027 printer owners: If you've had the same trouble I've had finding replacement ink rollers, buy an inexpensive stamp pad inker (roller type) and ink the roller with it. This produces much clearer, better defined letters than even a new roller!

Gene Schoepp
Barnegat, NJ

## ACTION! HELP

O.S.S.'s Mike Fitch was kind enough to pass along some information regarding Dave Plotkin's "Lights, Camera, ACTION!" article in the July 1984 issue. The SAVETEMPTS and GETTEMPS routines described there are adequate only if the interrupt routine does not perform mathematical operations other than addition and subtraction. The following versions of those routines will work properly in more general cases. Change the arrays in SAVETEMPS and GETTEMPS to the following:

```
SAVETEMPS="[$A2 $07 $B5 $C0 $48
  $B5 $A8 $48 $B5 $A0 $48 $B5 $80
  $48 $CA $10 $F2 $A5 $D3 $48]",
GETTEMPS="[$68 $85 $D3 $A2 $00
  $68 $95 $80 $68 $95 $A0 $68 $95
  $A8 $68 $95 $C0 $E8 $E0 $08 $D0
  $F0]"
```

## STAR RAIDERS

In response to Carol Waskowski's inquiry in the July I/O Board about others attaining Star Commander Class 1 in Star Raiders, I can proudly announce that I have obtained that level on many occasions. (Although Star Raiders remains one of the most popular Atari games, only a handful of readers indicated that they have achieved commander 1 status.–ANTIC ED)

The difference between Star Commander 5 and 1 is one's efficient use of energy. Here are some tips to help you save energy and improve your score.

When entering an enemy-occupied quadrant, don't engage your engines. Let enemy ships come to you. Never chase enemies with damaged engines, for the energy you waste is more than the value of the enemy ship.

Attempt to destroy distant ships as soon as they are in sighting range, about 120 centrons. This requires pinpoint firing, but can be done with practice. This helps avoid the close combat that is so deadly at higher levels—hits on your shields cost 100 units each.

Always know where the nearest starbase is, and follow the advice in the third paragraph of survival tactics in the game booklet.

Turn off shields when you're not in combat. This saves energy. There is a chance of asteroid collision, but it is slim.

There are other tips, but this should help. The main idea is to conserve energy.

David Horne
Foster City, CA

## WIPE OUT YOUR PROGRAM WITH ONE SIMPLE POKE

For those jaded Atari owners who are looking for just one more thing to do with their machines , we offer the following: POKE 202,1. Place this poke in your favorite program and your program will be wiped from memory when it ends. Your program will also be wiped if you hit [BREAK] or [SYSTEM RESET]. In fact, anything which generates the READY prompt will result in erasure of the pro-

# help!

gram. Interesting possibilities for protection schemes, no? Location 202 is the Load in Progress flag. When it has been set (by poking with a 1) the computer begins part of the load procedure immediately following the generation of the READY prompt. Among other things, the load procedure clears all program lines and variables from memory. —ANTIC ED

## INVESTIGATING WITH ATARI

I am in the business of motor vehicle accident investigation and reconstruction. Are there any Atari programs available for purchase that deal with accident investigation, vehicle weights and measurements?

Eldon Shannon
Huntsville, AL

*We don't know of any, but if anyone does, we'll pass the information along.*

—ANTIC ED

## INTERFACING COMPUTERS

I own both an Atari and a TRS Model 100. I use the TRS extensively at work and on the road, and the Atari at home. I would like to transfer text and download files from the TRS to the Atari.

Denny Bowen
Crystal Lake, IL

*Please see the "Electronic Notebook" article in the July, 1984 issue of* ***Antic****. It describes techniques for using the RS-232 connector (you'll need an 850 interface) and terminal software for both computers. This allows the machines to transfer data in ASCII.* —ANTIC ED

## THE EDGE OF LETTER PERFECT

When using Letter Perfect on my color TV I can't see the first letters on the left. This may be due to the kind of TV I'm using here in the Amazon jungle. Is there anything I can do about this?

Carlos Malaga
Inquitos, Peru

*The new Letter Perfect (version 6.0) has a Fix Window Width function that allows you to set the width of your display. Press [CTRL] [3]. If you don't have this updated version, contact LJK Enterprises.* —ANTIC ED

## MISSING INFOBITS

The assembly language source listing for "Infobits" (**Antic**, Dec. 1984) was left out of the previous issue. You'll find it in this issue's Software Library. —ANTIC ED

## MISSING LINE IN ADVENT X-5

If you're running into a bit of trouble during your adventures in "Advent X-5" (**Antic**, Nov. 1984), it may be due to a missing line. Add the following line: 8020 RUN. If the program locks up, you may be mistyping line 1005. The "TYPO II" code for that line is EJ. Watch out for the character just before the inverse f in that line, it's a [CTRL] [B].

## LITTLE BROTHER INSTALLED PROPERLY

I have found a problem with the installation of a color monitor with my Atari 400.

I used your article "Little Brother Grows Up," (April 1984) for a guide. The schematic on page 106 shows resistor R11 to have a value of 2.2 Ohms. This should be 2.2 kilo Ohms.

Matt Orsie
Budd Lake, NJ

*Thanks—this is the first time we'd heard about this. It's harder to test hardware fixes than it is to try new software, and we appreciate all the comments we get.*

—ANTIC ED

## BIFFDROP

Last month's Game of the Month, "Biffdrop," by J.D. Casten had some pretty tough lines to type in. Now that we have a new "Typo" program, we thought you might like the "Typo II" line-by-line codes followed by the line numbers. See the "Typo II" instruction article in this issue.

| | |
|---|---|
| MH 510 | JE 4002 |
| BQ 515 | SB 4003 |
| UC 520 | CO 4004 |
| BT 525 | YA 4005 |
| AV 580 | YA 4006 |
| IV 4000 | MM 9000 |
| KP 4001 | |

## ANTIC 4/5 EDITOR

Because of some interesting quirks in the Atari XL screen editing system, the DEMO listing of the "Antic 4/5 Editor Animator," (page 66, October 1984), will not run without the Translator disk. To get DEMO to run without Translator, change both 36's in line 52 to 35, and change the 39 in line 522 to 38.

## PLAYFUL PROFESSOR

We would like to thank you for the honorable mention given to us in the October 1984 issue of **Antic** for our Playful Professor Math Tutor. However, there *is* a cassette version for the Atari.

Roger Shiffman
Screenplay Intelligent Statements
Des Plaines, IL

## MISSING TANK LINES

In our September Help! column, we ran a letter with improvements for "Use BASIC to Animate". Unfortunately, some lines were omitted from the letter. We print them below.

Add these lines:

```
1301 POKE 752,1:? :? "NUMB
ER OF PLAYERS (2,3, OR 4)"
;:INPUT K
1302 IF K<2 OR K>4 THEN ?
CHR$(125):GOTO 1301
1303 ? CHR$(125)
1351 IF K<>3 AND K<>4 THEN
 POKE 53249,0
1352 IF K<>4 THEN POKE 532
50,0
```

Change these lines to read:

```
1170 D1=D1+1:IF K=4 THEN A
=PEEK(634):ON ((A=7)+2*(A=
11)+3*(A=13)+4*(A=14)) GOS
UB 590,660,730,800:POKE 53
278,1
1180 D2=D2+1:IF K=3 OR K=4
 THEN A=PEEK(633):ON ((A=7
)+2*(A=11)+3*(A=13)+4*(A=1
4)) GOSUB 310,380,450,520:
POKE 53278,1
```

Note that line 1180 is overlong and must be entered without spaces.

# STARTING A BULLETIN BOARD PART II

## Antic Pix BBS Software

by SUZI SUBECK

You read last month's **Antic** article about starting your own bulletin board and you've had an extra phone line installed. You're ready to dedicate your Atari system to a BBS, but . . . where do you go from here? This month **Antic** answers two of the most frequently asked telecomputing questions, "What is the best BBS equipment—and where can I get it?"

First of all, there is no standard "best" configuration for an Atari-based bulletin board—literally dozens of combinations of equipment will work. What's best for *you* depends on your overall BBS goals, as well as the amount of cash you can spare for this project.

### HARDWARE

The heart of a BBS is an auto-answer modem, which will allow your system to function in your absence. Certain modems require the currently hard-to-find Atari 850 interface. You will also need a printer and disk drives. The number and capacity of drives you use will determine the amount of programs you can upload and download.

The annual Buyers' Guide in **Antic** last month gave you our picks of the best modems, disk drives and printers at various price points and with a wide range of features.

### SOFTWARE

Probably the most important factor in choosing BBS software is to make sure it's compatible with your hardware—and does all the jobs you want. There are several types of bulletin board software (Also see **Antic**, July and August, 1984). Here's where to get the most popular BBS operating programs:

FOREM will run on any Atari with one to four disk drives of any density—including both 5 1/4-inch and eight-inch disk drives. There are versions that operate with the Atari 850, the ATR 8000 CP/M interface, and other configurations. One version is tailored specifically for the MPP modem.

Matt Singer, the author of FOREM, sells all versions of the software from his Maryland home, with the exception of the latest MPP version which is sold directly by MPP for $50. Singer is currently selling FOREM XL for $100. Once you have purchased a program from Singer, regular updates are available for downloading from his BBS, or you can get updates by sending him a blank disk with $5 for postage and handling.

AMIS software is in the public domain. Easily downloaded from various bulletin boards, AMIS comes in three main varieties, MACE AMIS, Standard AMIS and Fast AMIS.

MACE stands for Michigan Computer Enthusiasts. And this large users group makes the software available from the Main MACE and MACE West boards at least twice weekly. It's a good idea to call ahead and find out what nights AMIS will be offered.

Standard AMIS is regularly available for downloading from the CLAUG BBS. From time to time, it is also found on most other boards running AMIS. You can also get it by sending a blank disk and return postage to the sysop of just about any regular AMIS BBS.

Fast AMIS has built-in modem commands for a Hayes Smartmodem. It requires some modification to run with an MPP, Signalman Mark 7 or Mark 12 modem. Fast AMIS requires a different method of auto-answer than other BBS programs, and demands a different setting of the modem's internal DIP switches.

Fast AMIS is one of the easiest programs to run because it's virtually self-maintained. Message files compact automatically. The program does not require a printer on-line as FOREM does, and the only jobs the sysop must perform are erasing the caller log and rotating uploads and downloads regularly. Fast AMIS is available

continued on page 14

# CAN YOU SURVIVE 50 MISSION CRUSH?™




50 MISSION CRUSH™, SSI's exciting and unique role-playing wargame, puts you in the cockpit as pilot of the most glamorous bomber of World War II — the B-17 Flying Fortress.

As part of the 8th Air Force 306 Bomber Group stationed in England, you will fly dangerous bombing raids over Nazi-occupied France and Germany. Your goal: To survive fifty missions and achieve the rank of Brigadier General.

After each raid (if you've survived!), you'll be evaluated by the computer and awarded points based on such factors as: How difficult was the mission? How accurate was your bombing? How many enemy fighters did you shoot down? (Just as in real life, enemy fighter pilots get better at shooting down B-17's as time goes by!)

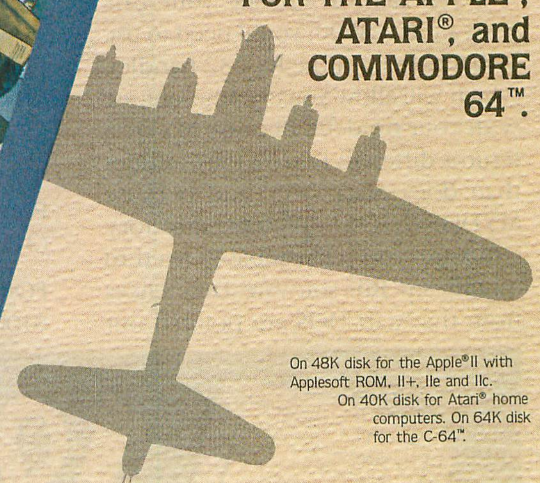
The more points you get, the closer you'll be to a promotion, and ultimately to wearing the General's shiny star.

This game's designer was the flight engineer on a B-29 bomber during the Korean War, and he's made sure everything about 50 MISSION CRUSH is historically accurate.

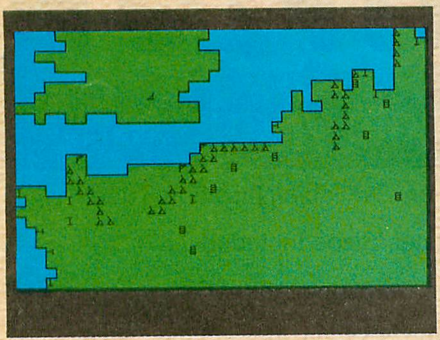
Surviving fifty missions and becoming General is no easy task. But if you do make it, send us a photo of the screen as proof, and we'll add to the celebration by awarding you a Certificate of Achievement.

To get your hands on a B-17 bomber, fly on down to your local computer/software or game store today!

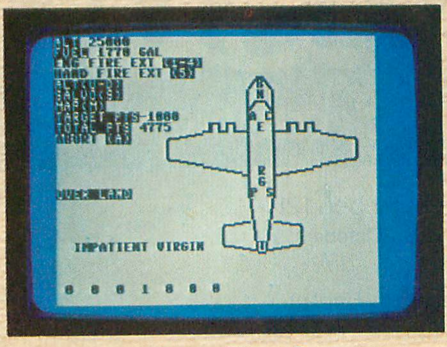
**FOR THE APPLE®, ATARI®, and COMMODORE 64™.**



On 48K disk for the Apple® II with Applesoft ROM, II+, IIe and IIc. On 40K disk for Atari® home computers. On 64K disk for the C-64™.



Screen display shows your base in England and your 22 targets in France and Germany — all heavily protected by enemy fighters and anti-aircraft batteries.




Data display of your Flying Fortress.




If you survive fifty missions and reach the rank of Brigadier General, we'll mail you this Certificate of Achievement to celebrate your remarkable feat.

SSI

STRATEGIC SIMULATIONS INC

If there are no convenient stores near you, VISA & Mastercard holders can order direct by calling 800-227-1617, ext. 335 (toll free). In California, call 800-772-3545, ext. 335. 50 MISSION CRUSH™ goes for $39.95, plus $2.00 for shipping and handling.

To order by mail, send your check to: STRATEGIC SIMULATIONS INC, 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (California residents, add 6.5% sales tax.) All our games carry a "14-day satisfaction or your money back" guarantee.

**WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES.**

**STARTING A BULLETIN BOARD**
continued from page 12

for downloading from the Valley Girl BBS at least once a week or by request.

Carnival software is essentially AMIS with an overlay to allow for private messages and passwords. It's no longer available from regular sources, but presumably could be obtained from a private owner. Carnival fell from wide usage because it demands a large amount of disk space and requires every bit of memory your system has.

If you plan to operate your BBS with an ATR 8000, you'll need to use MYDOS to boot the RS-232 handler, which will allow you to communicate with your modem. Because MYDOS returns different RS-232 status values than does Atari DOS, and because MYDOS has a different directory structure, you will probably need to modify any BBS software. Differences from the Atari DOS are pointed out in the MYDOS documentation.

Most sysops are more than happy to help out a sysop-to-be. They can provide you with a set of guidelines to use in setting up your board. Most of the long established systems you call today have experimented with various configurations of hardware and software , so they can offer excellent advice. Help is only a phone call away.

## BBS SOFTWARE SOURCES

Fast AMIS
Public domain from Valley Girl
(312) 747-4247

MACE AMIS
Public domain from Main MACE
(313) 978-1685; MACE West
(313) 582-0657

STANDARD AMIS
Public domain from CLAUG
(312) 889-1240.

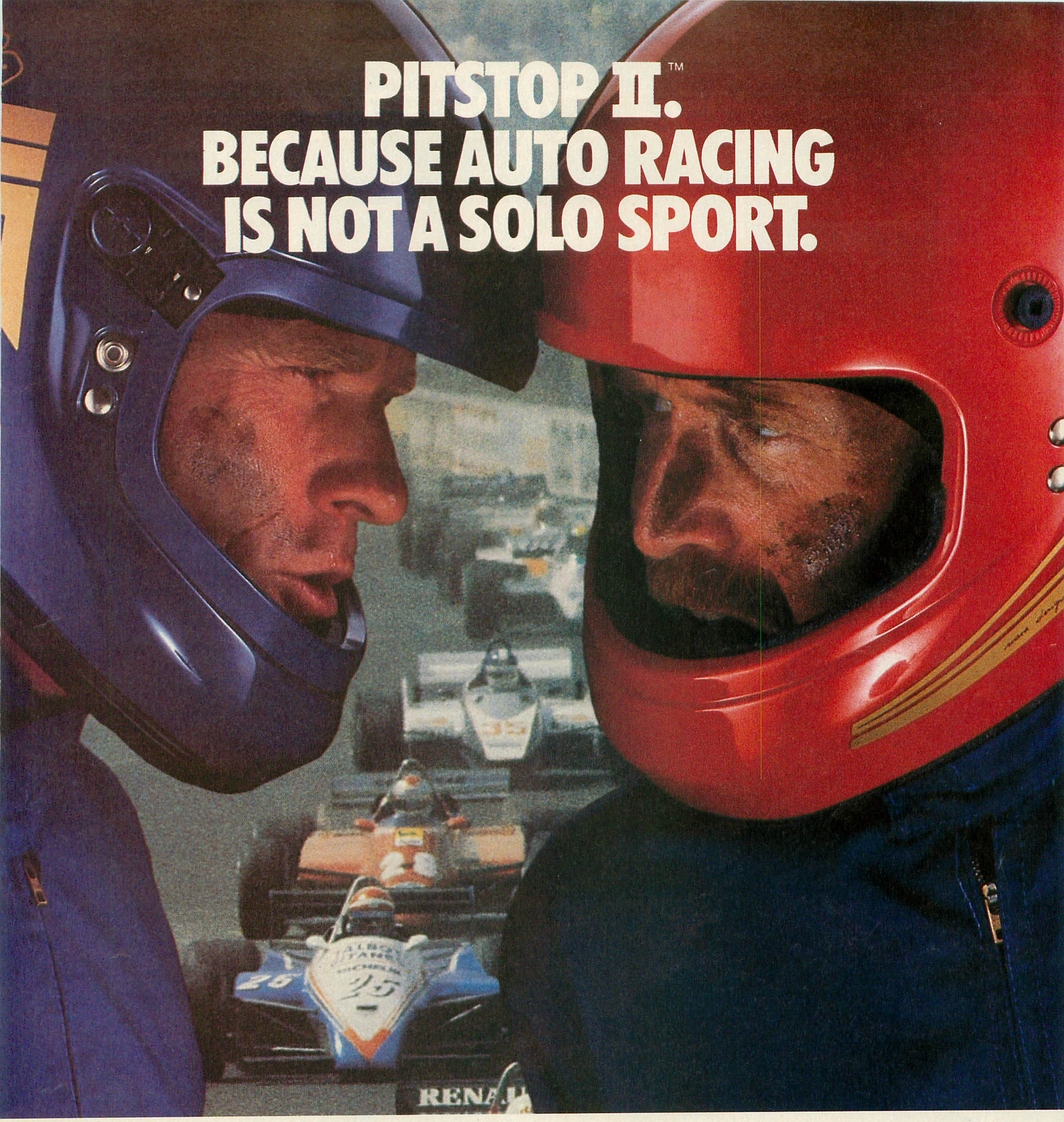
FOREM XL
$100. Matthew Singer, 6005 Cherrywood Court, Apt. 301, Greenbelt, MD, 20770. (301) 474-7583—voice, 5-8 PM, EST. (301) 474-7591—modem, 24 hours.

FOREM MPP
$50. Microbits Peripheral Products, 225 W. Third Street, Albany, OR 97321. (503) 967-9075.

*Antic Contributing Editor Suzi Subeck is a sysop and users group newsletter editor based with her family in the southern suburbs of Chicago*

## BIGGEST BBS LIST STARTS NEXT MONTH!

Starting with February, in the next few issues of Antic we'll print the most complete and current list of Atari bulletin board systems we know of. This list is compiled by the Boise Users Group BBS, it's updated bi-weekly, and names close to 250 active Atari boards.





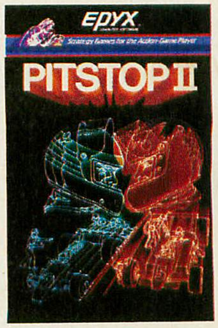

When we introduced Pitstop, we created action in the pits. Now, with PITSTOP II, EPYX introduces true competitive auto racing, both on the track and in the pits. Auto racing is not a one man sport. With PITSTOP II, you can now experience the thrill of speed and competition as you battle your opponent in a race against the clock. Now, more than ever, the strategy of when you make a pit stop and your pit crew's speed and performance, combined with your skill on the track, will determine the winner.

A split screen shows you your position and that of your opponent, a digital clock displays time and a lap counter gives you your race position as you race against each other in pursuit of the checkered flag. You can also play against the computer or take a few practice laps as you prepare for the real head-to-head competition. Step up to PITSTOP II because auto racing is not a solo sport.

*One or two players: joystick controlled; disk or cassette.*

EPYX™
COMPUTER SOFTWARE

**Strategy Games for the Action-Game Player**



# BASIC SEARCHER

## "Global search" for programmers

by SCOTT SHECK

Global search is one of the most useful editing functions found in good word processing software. Now you can make use of the same powerful editing tool when you're revising or debugging your own BASIC programs.

*BASIC Searcher finds the lines containing any command, operator, function or variable in your BASIC program. The program works on all Atari computers of any memory size. Antic Disk subscribers, follow the directions in the article.*

BASIC Searcher is a utility that can find all the lines containing any BASIC command, operator, function or variable in your program. It is compatible with BASIC XL (O.S.S.) and can be used with any BASIC program having line numbers below 31900.

First, type in the program listing, check it with TYPO II, and LIST it to disk using LIST "D:SEARCH.LST". Cassette owners should type LIST "C:"

### HOW TO USE BASIC SEARCHER

Once the computer has a BASIC program in memory, type ENTER "D: SEARCH.LST or "ENTER C:" to merge your program with BASIC Searcher. Your program MUST be in memory before you ENTER the BASIC Searcher program!

Next, type GOTO 31900. After a brief pause, a list of your program's variables will appear on the screen. Occasionally, this list will include variables which no longer exist. This occurs because BASIC Searcher references your program's Variable Name Table which, in the case of a SAVEd file, may have retained previously deleted variables. To clear the Variable Name Table, LIST your program to disk or cassette, type NEW, and ENTER your program again.

Each variable in the list will be accompanied by a reference number. To locate a particular variable in your program, type in its corresponding reference number and press [RETURN].

Now, type [S] to have your results printed on the screen, or [P] to have your output sent to a printer.

The program will print an "END OF SEARCH" message when it's through. If you want to perform another search, type [Y]. If not, type [N] and BASIC Searcher will erase itself from your program.

BASIC Searcher can also find BASIC reserved words, constants and character strings. Just type in a reference number from the accompanying Table. If you were looking for every occurence of the POKE command, for example, you'd type in [31] and press [RETURN].

Although BASIC Searcher will find all references to specific variables, it cannot isolate individual constants or character strings. If you're searching for constants (reference number 14) or strings (number 15), BASIC Searcher will print out *all* references to *every* constant or string in your program.

### HOW IT WORKS

BASIC Searcher looks for *tokens*, the one-byte codes which the Atari's BASIC interpreter uses to represent reserved words, variables and other pieces of information.

Tokens for BASIC reserved words are represented by ATASCII characters 0 through 84. The computer represents your program's variables with ATASCII characters 128 through 255. (This is why a program may not have more than 128 variables.)

As the computer interprets a BASIC program, each variable is assigned a token, beginning with ATASCII 128, and this token is appended to the Variable Name Table. At the same time, the variable's name is added to the Variable Name List, and its value is stored in the Variable Value Table. The computer uses these tables to keep track of your program's variables. BASIC Searcher looks through the Variable Name Table and the Variable Name List when analyzing your program.

continued on next page

## REFERENCE NUMBER TABLE

| | | | |
|---|---|---|---|
| 0 | REM | 43 | GRAPHICS or ( |
| 1 | DATA | 44 | PLOT or ) |
| 2 | INPUT | 45 | POSITION or = [arithmetic] |
| 3 | COLOR | 46 | DOS or = [strings] |
| 4 | LIST | 47 | DRAWTO or <= [strings] |
| 5 | ENTER | 48 | SETCOLOR or <> |
| 6 | LET | 49 | LOCATE or >= |
| 7 | IF | 50 | SOUND or < |
| 8 | FOR | 51 | LPRINT or > |
| 9 | NEXT | 52 | CSAVE or = |
| 10 | GOTO | 53 | CLOAD or + [unary] |
| 11 | GO TO | 54 | Implied LET or — |
| 12 | GOSUB | 55 | ERROR [syntax] or ( [strings] |
| 13 | TRAP | 56 | ( [arrays] |
| 14 | all constants or BYE | 57 | ( [DIM arrays] |
| 15 | all strings or CONT | 58 | ( [functions] |
| 16 | COM | 59 | ( [DIM strings] |
| 17 | CLOSE | 60 | , [arrays] |
| 18 | CLR or , | 61 | STR$ |
| 19 | DEG or $ | 62 | CHR$ |
| 20 | DIM or : | 63 | USR |
| 21 | END or ; | 64 | ASC |
| 22 | NEW | 65 | VAL |
| 23 | OPEN | 66 | LEN |
| 24 | LOAD | 67 | ADR |
| 25 | SAVE or TO | 68 | ATN |
| 26 | STATUS or STEP | 69 | COS |
| 27 | NOTE or THEN | 70 | PEEK |
| 28 | POINT or # | 71 | SIN |
| 29 | XIO or <= [arithmetic] | 72 | RND |
| 30 | ON or <> | 73 | FRE |
| 31 | POKE or >= | 74 | EXP |
| 32 | PRINT or < | 75 | LOG |
| 33 | RAD or > | 76 | CLOG |
| 34 | READ or = | 77 | SQR |
| 35 | RESTORE or | 78 | SGN |
| 36 | RETURN or * | 79 | ABS |
| 37 | RUN or + | 80 | INT |
| 38 | STOP or — | 81 | PADDLE |
| 39 | POP or / | 82 | STICK |
| 40 | ? or NOT | 83 | PTRIG |
| 41 | GET or OR | 84 | STRIG |
| 42 | PUT or AND | | |

*Scott Sheck is one of the most creative and prolific utility programmers appearing in **Antic**. Last month's issue featured his "Word Storage Space Saver," an almost fiendishly clever method of reducing memory waste in text storage.*

Listing on page 53.

# Introducing

# TYPO II

## Easier proofreading for Antic type-ins

TYPO (Type Your Program Once) by Bill Wilkinson of Optimized Systems Software started in the third issue of **Antic**—August, 1982. It was the first automatic proofreading program for type-in listings ever printed in a computer magazine. We reprinted TYPO several times and have been been using it with all our listings ever since—but now TYPO is going into a well-deserved retirement.

### ENTER TYPO II.

The main trouble with the original TYPO is that it didn't show exactly what line contained a typing mistake. This made it too hard for beginners to use comfortably.

But TYPO II pinpoints every mistyped line—immediately after you type it. It can also find transposed characters which were invisible to its predecessor.

TYPO II even lets you use abbreviated commmands. But don't mix up PRINT with [?].

**Antic** tapped Andy Barton ("Info Bits," Dec., 1984) to write TYPO II. Andy cheerfully put the program through an extensive debugging process to make it compatible with all Atari computer models. Then when we believed the program was perfected, we asked Bill Wilkinson to look at it. And Bill contributed some ideas that enabled Andy to make TYPO II even shorter and simpler.

—ANTIC ED

### HOW TO USE TYPO II

TYPO II *finds the exact lines* where you make mistakes while typing in **Antic** BASIC listings. This short all-BASIC proofreading program starts in the January 1985 issue, it works with all Atari computers of any memory size.

Type in TYPO II and SAVE a backup copy to disk or cassette. (Users of the O.S.S. Basic XL cartridge must type SET 5,0 and SET 12,0 before they RUN the program.) To start TYPO II, type GOTO 32000. The TYPO II screen should appear, displaying the instruction, "Type in a program line."

Respond by typing in the first line of any 1985 **Antic** BASIC program. You will see the line reappear near the bottom of the screen— with a two-letter code at the left of the line number. Check these code letters against the correct two-letter code printed left of the same line in the magazine listing.

If the codes don' match exactly, you mistyped something in *that* program line. Simply press [RETURN] and the line will move back towards the top of the screen for editing. *Don't* type in those two-letter correction codes as part of the program line.

When the codes are an exact match, just type the next program line.

IMPORTANT: To call up *ANY previously typed line* for checking with TYPO II, type an asterix [*], followed (with no spaces in-between) by the number of the first program line you want to proofread. Then press [RETURN]. Use this procedure to check every line of TYPO II before you proofread other **Antic** programs with it.

You can LIST your program by pressing [BREAK] and typing LIST. Switch back into TYPO II anytime by typing GOTO 32000.

To remove TYPO II from your program: Type LIST "D:FILENAME",0, 31999 (Cassette owners LIST "C:",0, 31999). Type NEW, then ENTER "D: FILENAME" (ENTER "C:" for cassettes). Your program is now in memory without TYPO II and can be SAVEd or LISTed to disk or cassette.

(Of course, if you still get tired of typing in all six-or-more listings per issue —you can subscribe to **Antic** Magazine + Disk for only $99.95 yearly, and send for back issue disks at just $12.95 each. See order forms in this issue.)

Listing on page 52.

# INTERVIEWING DAN BUNTEN

## Designer of "Seven Cities of Gold" & "M.U.L.E."

by ARTHUR LEYENBERGER

*Ozark Softscape is located in the game design hotbed (?) of Little Rock, Arkansas and it has created two of the most impressive games available for the Atari—the 1983 award winning science-fiction economic simulation* ***M.U.L.E.*** *and 1984's graphics-scrolling conquistador simulation* **Seven Cities of Gold**. *Both of these remarkable games are marketed by Electronic Arts (2755 Campus Drive, San Mateo, CA 94403, 415-571-7171).*

*The principal game designer and most visible spokesman of Ozark Softscape is Dan Bunten, whose earlier games include Computer Quarterback, Cytron Masters, and Cartels & Cutthroats.*

*The rest of Ozark Softscape consists of:*

*Bill Bunten, Dan's brother, who has a Master of Business Administration degree and shares the design responsibility with Dan as well as being the primary play tester.*

*Jim Rushing, another MBA, who is kept busy writing most of the heavy-duty number-crunching code for the Ozark games.*

*Alan Watson, whose specialty is graphics and animation programming. He has a math background and ten years' experience in high-end stereo retailing.*

*Ozark Softscape has developed a game development routine, during its two years of existence. All four members decide what type of player experiences they want in their next game. Then Dan or Bill will produce a topic, flesh it out and bring it in for discussion. After the opening rounds, Dan and Bill come up with a game skeleton, including memory requirement estimates. From there, the work, and the fun, really begins.*

*Dan Bunten does not fit the programmer stereotype. Although he is an engineer by training, he prefers not to talk of bits and bytes but about what can be created with leading-edge technology. His interests range widely, from social biology to science-fiction, from philosophy to history and education . . .*

**Antic:** How did you get the idea for Seven Cities?

**Bunten:** When my brother Bill and I were kids, my uncle gave us a book on the Conquistadors and we thought, Wow! Then there was a strategy board game from SSI, a war game called Conquistador that was part of their magazine. That was neat but it was awfully unplayable. We had a list of themes that were of interest to us and when we were ready to begin a new project we did not want to do another multi-player game like M.U.L.E. So we looked down the list and said, "Here's Conquistador."

Actually, we were not too excited about it at first. But as we started to do the research on it, we thought we could really do something good. After two months of research and just free-flowing ideas, we spent another month writing the story boards. Then six months of coding and it was out.

**Antic:** How far into the initial research phase do you go before you decide whether the concept will succeed?

**Bunten:** Normally, we just try to push through. To a certain extent we can always figure something out. Since there are a lot of people involved somebody will usually have an idea. There are the four of us in Ozark Softscape, there's our publishers at Electronic Arts, our play testers—somebody is going to come up with something.

The big idea with Seven Cities is the concept of Discovery. We have a giant world; spread it out, and it would be 12 by 20 feet. You are sitting there with a 3-1/2 inch window on this 12 by 20 foot world. That's big. You will never have a sense of knowing everything. You get lost or end up in the boonies.

The other things were to keep a pace going, to be fun, be easy. To transfer things was the most awkward part of the game. Yet it is actually pretty simple compared to other alternatives. But next time we will do those even better.

**Antic:** I think the game really does capture the flavor of what the Conquistadors must have been feeling. Especially with the random continent feature.

**Bunten:** Yes, in a random continent game, even when you find land, you

don't know what will be there. You can end up with a randomly generated continent full of a higher tech civilization than the Europeans.

Our model for that was the Japanese and Chinese. If the Conquistadors had landed in China or Japan, the Europeans would not have had a chance. They couldn't have come in and said, "We are going to blow you away and take everything you've got." They would have been lucky to get enough food to go back home.

**Antic:** When I first received Seven Cities, I thought, "Oh no, the manual doesn't tell you anything!" Then I started playing the game and figuring things out. The manual gives a historical perspective.

**Bunten:** Most people would just start playing the game. We looked at the possibility of not having to use a manual. We gave our testers just a disk and didn't say anything. It didn't go over wonderfully but some people loved the idea of discovering all of it.

And then I would get a call from somebody saying, "I can't get off my ship." They had never pushed the button standing still, to find the pull down menus. And "Drop Stuff Off" didn't sound like how you would get off your ship. Some of that has to be explained.

**Antic:** I thought "Drop Stuff Off" sounded a little strange.

**Bunten:** We pondered over that. If **Antic** readers can come up with a better phrase, we might even change it for the next version of the game. We were going to drop "stuffo" off (a Spanish word for it). We thought about "Transfer". Actually it was my wife's idea. I explained to her that what we were trying to do was drop stuff off, and she said why don't you just call it that. So we put it into a preliminary version and it stayed.

**Antic:** One feature of Seven Cities that I find difficult to understand is the way you might bump into the natives and accidentally kill them. Even when I am very careful, I still end up killing a few innocent natives.

**Bunten:** Because you don't share a language with the natives, your only way of communicating is by the gestures you make . . . your body language. All the natives can look at is

continued on page 25

In Seven Cities of Gold you're a Conquistador and ship captain searching for new worlds and treasure.

Funded by the crown and outfitted with men and supplies, you sail west into the unknown. Awaiting your expedition are over 200 villages of small tribes and the great cities of the Aztec and Inca empires. Your game can use historically accurate geography and 16th century demographics. Or you can choose to face the total unknown of computer-generated random continents.

Ozark's other game, M.U.L.E. takes place on a distant planet, where up to four players (only two players if you have an Atari XL) must either compete or cooperate to colonize this world in the allotted time. The four basic commodities—food, energy, Smithore and Crystite—are used by the players to increase their wealth and the overall well-being of the settlement.

M.U.L.E., for "multiple use labor element," represents a machine that allows colonists to get things done. During each round, players must vie for plots of real estate. Then they choose whether to produce energy or food, or to mine their land for Smithore (used in the manufacturing of M.U.L.E.s) or Crystite (much like diamonds). Players then sell surpluses and buy commodities.

M.U.L.E. demonstrates a free enterprise system at work. Prices are set by supply and demand, economies of scale exist and the learning curve theory of product provides increased output over time.



# OSS WRITES ONLY PRECISION SOFTWARE... OUR CUSTOMERS WRITE OUR BEST ADS!

## BASIC XL

"BASIC XL is a fast and powerful extension of Atari BASIC, totally compatible with virtually all software. Its many features make programming easy, especially games that require player/missile graphics. For people writing business software or translating existing programs from other computers, the new string arrays and other string-handling features make the task manageable. BASIC XL is a truly professional language that should become standard in all future Atari computers. Overall Rating—A." *The Addison-Wesley Book of Atari Software 1984*

**BASIC XL SuperCartridge & Manual** ***(Requires 16K Memory)*** .................... **$99.00**

## ACTION!

"For those who have found BASIC to be too slow or assembler to difficult, ACTION! is the logical alternative. ACTION! programs can increase speed from 50 to 200 times that of BASIC." *Jerry White, Antic, February 1984*

**ACTION! SuperCartridge & Manual** ***(Requires 16K Memory)*** .................... **$99.00**

## MAC/65

"For the serious machine language programmer or anyone interested in programming in 6502 machine language, this package is a must. A lot of the good professional software on the market, games or otherwise, was written using this brute. Coding machine language with anything else is like trying to swim upstream in quicksand." *ACE Of West Hartford, May 1984*

**MAC/65 SuperCartridge & Manual** ***(Requires 16K Memory)*** .................... **$99.00**

# THE WRITER'S TOOL was designed for WRITERS who want to WRITE!

When you want to write on your Atari® Computer—a letter, a business report, or a book—**you want to concentrate on writing and not on the word processor** that you are using.

You want to **write immediately without** having to spend hours **learning some fancy system or remembering complicated commands.**

You want to **write quickly...**as fast as your imagination can fly. Then **edit just as fast...**correct mistakes; change, add, or delete words and phrases; rearrange the sequence of paragraphs or entire pages **without fearing that one slip of your fingers might wipe-out hours of precious work.**

You want to be able to save or retrieve your text files **on any type of Atari compatible disk drive** using either single-density or double-density disks without worrying about accidentally erasing files.

You want to be able to **print out your finished piece right away,** using all of **your printer's capabilities** such as Pica, Elite, and condensed type; print two-columns on 8½" wide paper and proportional spacing; and print different types of characters: double-width, **boldface,** *italics,* underlined, superscript, and subscript.

**Compare THE WRITER'S TOOL** with the others: feature for feature, dollar for dollar—**if you can find a better word processor, buy it!**

**THE WRITER'S TOOL***
**SuperCartridge, Program Disk, Tutorial & Reference Manual** ................ **$129.95**

**Requires an Atari® Computer with 40K memory, disk drive, and any Atari compatible printer.*

*ATARI® is the registered trademark of ATARI, INC.*

**Now Available At Your Software Dealer!**

OSS™

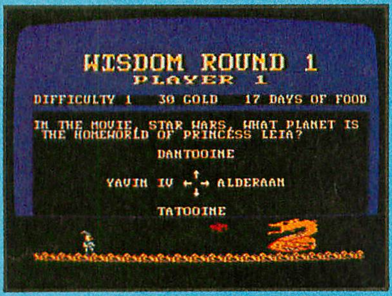
**Optimized Systems Software, Inc.**
1221B Kentwood Avenue, San Jose, California 95129 (408) 446-3099

# SURVIVAL OF THE SMARTEST . . .

EXCITING, NEW & DIFFERENT!

**Outsmart your Friends.**
**Outwit the Dragon.**
**Join the Quest.**

Here are just a few of many screens.




**THE CHALLENGE.**
Over 2000 stimulating trivia/fact questions will send you rummaging through your personal memory banks. Answer correctly and advance in your quest while adding more gold to your treasure. Fail and you lose ground.




**THE ACTION.**
You may have to face and battle a ferocious dragon. If you prevail, the dragon's cache of gold will be added to your treasure. If you fail, your journey will be slowed while you heal your wounds.



**THE STRATEGY**
Each questing party consists of three characters, a Knight, Prince and Page. Each has distinctly different physical characteristics, and all must complete the Quest. You must decide when to send them on to the next challenge.

48K Atari Disk
**$39$^{95}$**

Challenging excitement for 1 to 4 adventurers




This exciting new concept in computer entertainment will keep you and your friends involved for hours and hours. This is probably the best party-game ever developed, and new question disks will be available.
**Optional:** Utility disk which allows you to create unlimited trivia questions and answers for educational or entertainment. The utility disk also includes over 1000 additional questions. **Utility disk $24.95.**

*Royal Software*

*"Software fit for a king!"*
2160 W. 11th • Eugene, OR 97402 • (503) 683-5361

**Ask for Trivia Quest at your favorite Atari Computer Store or order directly from Royal Software. Use your MasterCard, Visa, American Express, or send check or Money Order including $2.90 shipping and handling.**

# Turn your Atari into a Ferrari.

Introducing the all-new 1984 Indus GT™ disk drive. The most advanced, most complete, most handsome disk drive in the world.

A flick of its "Power" switch can turn your Atari into a Ferrari.

**Looks like a Ferrari.**
The Indus GT is only 2.65" high. But under its front-loading front end is slimline engineering with a distinctive European-Gran flair.

Touch its LED-lit CommandPost™ function control AccuTouch™ buttons. Marvel at how responsive it makes every Atari home computer.

**Drives like a Rolls.**
Nestled into its soundproofed chassis is the quietest and most powerful disk drive power system money can buy. At top speed, it's virtually unhearable. Whisper quiet.

Flat out, the GT will drive your Atari track-to-track 0-39 in less than one second. And when you shift into SynchroMesh DataTransfer,™ you'll increase your Atari's baud rate an incredible 400%. (Faster than any other Atari system drive.)

And, included as standard equipment, each comes with the exclusive GT DrivingSystem™ of software programs. World-class word processing is a breeze with the GT Estate WordProcessor.™ And your dealer will describe the two additional programs that allow GT owners to accelerate their computer driving skills.

Also, the 1984 Indus GT is covered with the GT PortaCase.™ A stylish case that conveniently doubles as a 80-disk storage file.

**Parks like a Beetle.**
The GT's small, sleek, condensed size makes it easy to park.

So see and test drive the incredible new 1984 Indus GT at your nearest computer dealer soon.

The drive will be well worth it.



INDUS™

**The all-new 1984 Indus GT Disk Drive.**
*The most advanced, most handsome disk drive in the world.*




For additional information, call 1-800-33-INDUS. In California, call 1-800-54-INDUS.8|18/882-9600.

**INTERVIEWING DAN BUNTEN**
continued from page 21

whether your gestures seem neutral or hostile. The potential for missed cues on both sides is enormous. It may be stretching it, but we actually designed that specifically. Unfortunately it ended up looking like an arcade game that doesn't quite work, because these guys just bump into things and die.

**Antic:** Do you have any strategy tips for playing Seven Cities?

**Bunten:** The peaceful approach really works best. I have not used a totally depraved approach and won. You've got to have some friends somewhere. If something goes wrong, you need a friendly mission where you can go back and not have to worry about an insurrection or something. A place you can return to and know that there will be food, for example. You need a series of these relatively safe places even if you are going on a conquest mission.

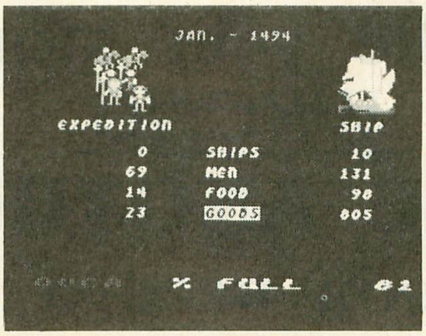
If you continually abuse the natives you will eventually see a message from the king saying "Don't treat the natives so badly. But keep the gold coming." This double standard is straight out of history.

**Antic:** You treat the morality question in an interesting way.

**Bunten:** I do not want to preach to the player what is right and wrong. But I want to give them a chance to get in touch with themselves about how they do feel. In play testing we found that people would rationalize why they used force against the natives. They would say things like, "I only did it because the natives asked for too many gifts". People felt they had to explain their behavior.

**Antic:** How do you win Seven Cities?

**Bunten:** However you want. Seven Cities is a process type game, you go along like real life. Life doesn't have ends and wins and things like that. It has processes that you go through and at times you stand back and say, "Hey,




SEVEN CITIES OF GOLD

I've done pretty good so far." Set your own goals really high and say, "That's how I win." Then go for it.

**Antic:** In a way, this is really a learning game.

**Bunten:** Learning and fun are not mutually exclusive terms. Play is an important element in our lives. It is unfortunate that as adults we tend to regard play as a separate activity which you do when you have a little free time—rather than say there is a natural joy in learning.

As adults, our real joy comes from learning new things. Discovering or learning something new is done for pleasure. That's what it is all about. Having the opportunity to expand yourself, that's what is entertaining and educational.

**Antic:** How did you become involved with programming?

**Bunten:** I started out in Industrial Engineering and one of the first courses we had to take was programming, Fortran on a big IBM. The first time I got it to print A+B=C I was so excited. I did it and then I figured out that I could also make it print out little pictures with letters on a line printer. I though it was wonderful and I knew someday I was going to have my own computer, but I figured that I would have to be a millionaire first.

As it turned out, I got my first Apple computer in 1979 and I could do things at home. I was working as an Industrial Engineer and had access to a computer at work. So I wrote a few games for the enjoyment of myself and friends. I did some really goofy stuff.

**Antic:** Are you limited because of the hardware?

**Bunten:** That's a cop-out if we blame the hardware. The hardware helps but it isn't all there is. Look at the hardware of a book. I mean it is black and white on a piece of paper and yet it comes across. It's grammar among other things. We don't even know the software's grammar yet, much less how to develop characters and carry a plot line. We have a ways to go and are really at the beginning. But it is fun to be part of it.

**Antic:** What was your first commercial program?

**Bunten:** Wheeler Dealer. No one remembers it, only a hundred were sold. It was a 16K cassette game for the Apple. Integer Basic, and it required this hardware thing we made ourselves to allow four people to do the bidding in the game.

**Antic:** Does a person who wants to break into the game design field have to be a super coder?

**Bunten:** Not necessarily. There are a lot of good designers around who aren't great programmers. But knowledge of coding helps. Because you know the machine and when you push the boundaries you know what you can and cannot do. Knowing about human engineering also helps.

**Antic:** The human interface is really one of the strong points of Electronic Arts products. Their ease of use is a hallmark.

**Bunten:** It's amazing—M.U.L.E. was done years ago in an entirely different form for a 16K Apple—a real-time stock market simulation. It didn't go anywhere and probably never could have if it wasn't for a company like Electronic Arts. Their ability to support and guide us and to pull together ideas really helped. And patting us on the back, too, because we need a lot of that. We are out in the boonies and

continued on page 28

**INTERVIEWING DAN BUNTEN**
continued from page 25

the attitude of people we deal with is "You write games for a living?" I really have to justify myself to my in-laws.

**Antic:** Can you talk about your next project?

**Bunten:** I could if I knew. We have a lot of ideas though. So we rented two cabins on a lake and are going on a retreat next week where we will relax and talk about what's next.

**Antic:** To what extent do you think a person's program reflects their personality?

**Bunten:** To an amazing extent. There are several people that I have not yet met, but I think I kind of know what they are like just having seen their games. You can tell if the guy was willing to get into the nitty gritty without concern for complexity. This is called dirt in war game programming terminology and some people actually enjoy the dirt and they will create games with a lot of it.

**Antic:** Do you think of yourself as a programmer turned artist or an artist turned programmer?

**Bunten:** None of the above really. I like the idea of being an artist but I think there is a lot more to be done and it is presumptuous to put that label on yourself. Real artists do things that pull your emotions in. A good film or a good book can play you like a fiddle.

**Antic:** Doesn't Seven Cities do that? When I get lost at sea for example, I'm very upset. My emotions are drawn in by the game.

**Bunten:** It is a start, a small step towards being able to do that. We have learned a little bit and have made a step. But the spectrum of emotions that we can create and trigger in software is limited right now. We are not yet to the point where you are going to cry because your character died. I want that, but we won't see it until the software technology matures more.

*Arthur Leyenberger is a human factors psychologist in New Jersey. He does microcomputer consulting and freelance writing. He's been an Atari activist for about three years. In fact, he conducted this interview while waiting at the airport with Dan Bunten after the game design star spoke to a users' group.*

# Flight Simulator II

For Atari computers with 48K memory



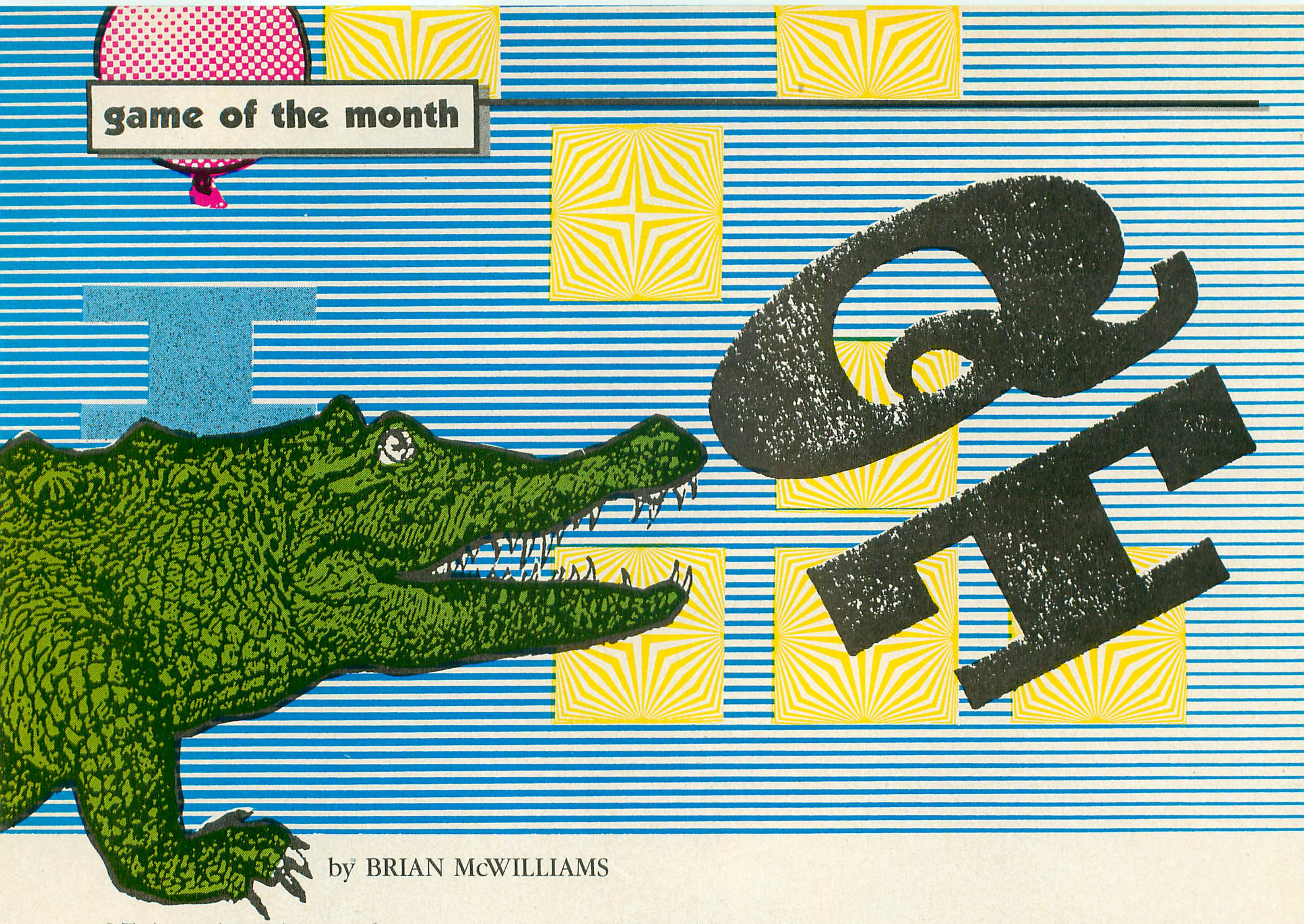
Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

## *See your dealer . . .*

or write or call for more information. For direct orders please add $1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

**Order Line: 800/637-4983**

**subLOGIC**
**Corporation**
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995




by BRIAN McWILLIAMS

*Q.T. is an inventive arcade game boasting three different screens, each with six increasingly nerve-wracking levels of difficulty. The BASIC program runs on all Atari computers with 24K memory for cassette or 32K for disk. Antic Disk subscribers, RUN "D:QT.BAS"*

Meet Q.T., a cute little bird who lives inside a dangerous arcade game. If you care about wildlife preservation, you'll help Q.T. survive six increasingly difficult levels of game play— on three different screens.

The first screen is crowded with ice cubes as Q.T. races the timer to put four corner blocks in their assigned positions. Q.T. gets points for eating cubes, or kicking them against the side walls with the joystick button. If the timer runs out before the (inedible) corner blocks are all correctly placed, "Bye bye, Q.T." There's less time at each higher level.

Your score is displayed in the upper left corner, the number of remaining lives is at the upper right. Displayed at the lower right are all bonus objects collected. High score also remains displayed until the computer is turned off.

A bonus object waits on a platform at the right of the second screen, while a deadly snapping jaw threatens from the left. Q.T. stands at the bottom of the playfield and can only move left or right— while catching objects falling from the top. Every missed object brings the snapping jaw closer; every object caught brings the bonus object nearer. Oh yes, Q.T. must *dodge* some of the falling objects— birdie-crushing I-beams.

Q.T. takes to the air in the third screen, trying to pop as many balloons as possible. Each balloon carries an item worth points. Q.T. moves left or right with the joystick. Pressing the fire button causes Q.T. to flap. Without flapping, Q.T. glides down. Balloons move faster in the higher levels.

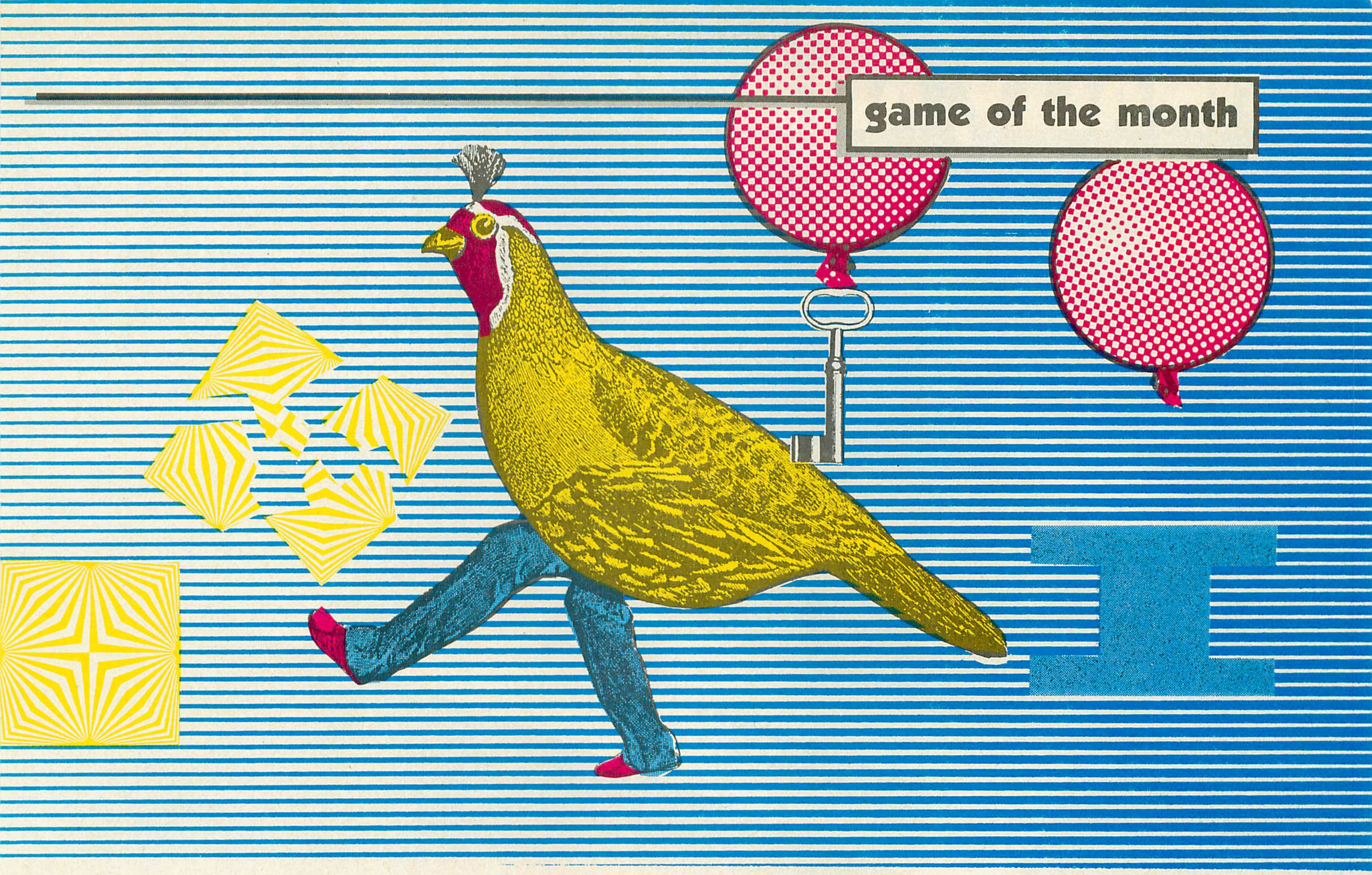
Q.T. can die by gliding off the screen, or by getting crushed with a falling object. If all six levels of the game are survived, Q.T. will be safe at last on the "You Win!" screen.

Type in the Q.T. listing, check it with TYPO II, SAVE a back-up copy and RUN the game. Your screen will go blank for about 10 seconds and then display the title screen. Press the joystick button to start. And be sure to press [RESET] before re-running the game.

*Brian McWilliams is 17 and a senior at Alpena High School in Michigan, where he's able to take quite a few computer classes. He's currently working on an action game called "Droids."*

### Q.T. PROGRAM TAKE-APART

| | |
|---|---|
| 10 | Dimension variables |
| 20 | Get high score |
| 50–90 | Title page |
| 100–160 | Main module |
| 200–650 | 1st board |




| | |
|---|---|
| 800–1030 | 2nd board |
| 1050–1630 | 3rd board |
| 1600–1630 | Death routine on 3rd board |
| 1640–1710 | Q.T. introduces new bonus item |
| 1800–1840 | "You Win!" routine |
| 7000–7310 | Subroutines |
| 7020 | Erase screen |
| 7100 | Display score |
| 7110–7120 | Display lives |
| 7130 | Display time |
| 7190–7260 | Death routine |
| 7270 | Poke high score into memory |
| 7300–7310 | Takes care of timer |
| 10000–10060 | Changes character set |
| 10070–10075 | Data for USR call |
| 10080–10180 | Character set Data |

## Q.T. VARIABLE LIST

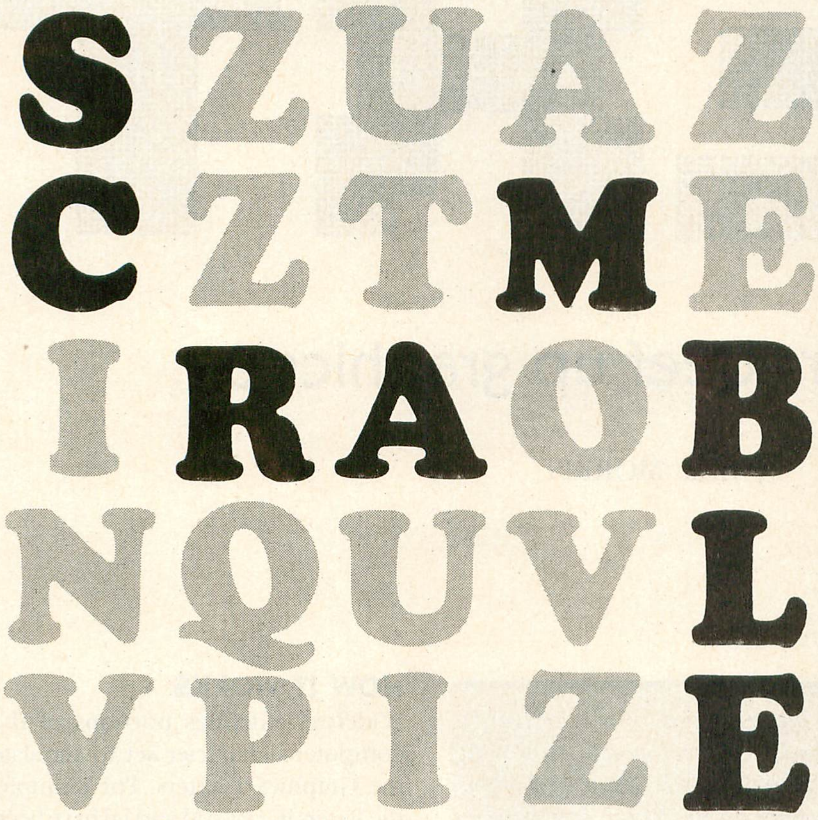
| | |
|---|---|
| A$ | Holds value of high score before POKEing it into memory |
| MOVE$ | Holds ML subroutine for moving the character set |
| A | Reads stick position, loop variable, and other various uses |
| B,X,Y | Loop variable and other various uses |
| BC | Bird color |
| BI | Bonus item color |
| BIC | Bonus item counter |
| BLL | Balloon color |
| BLLY | Balloon Y-position |
| BONUS | Bonus accumulator |
| BRD | Board counter |
| C | Used to check an object's path for obstacles |
| C1 | Use instead of "1" |
| CC | Check corner blocks' path for obstacles |
| CHANGE | Reads Data for new character set |
| FR | Falling rate and rising rate for objects or balloons |
| HI | Holds high score |
| IC | Item color for object to fall or item attached to balloon |
| INSET | Internal character code for character to be changed |
| IP | Object or balloon X-position |
| IV | Item value |
| JUNK | Variable used for USR call |
| LIVES | Number of lives left |
| LL,LR,UL,UR | Checks corners on first board |
| NH | Number of objects caught |
| NM | Number of objects missed |
| O | Used instead of "0" |
| OFF | Used instead of "7290" |
| SCORE | Current score |
| TIME | Time remaning |
| XP | X-position of Q.T. |
| XX | Loop variable |
| YP | Y-position of Q.T. |
| Z | Value of bonus item |

Listing on page 54.


FINALLY, ANTIC FULL STRENGTH!
MAGAZINE + DISK
NO MORE TYPING long, complex listings. Now . . . you can IMMEDIATELY start using all the great programs in your copy of Antic every month. New ANTIC DISK SUBSCRIPTION: 12 issues of the best-selling Atari magazine—each with a high-quality disk containing every software listing in the issue READY TO RUN!
Communications
Vol. 3 No. 3
Antic
The ATARI Resource
Save $55! Send us the subscription card with your payment of $99.95 now—for a big 37% discount off the $12.95 newstand price. For convenient billing to your Visa or Mastercard, just phone toll-free 800-227-1617 (in California 800-772-3545).
MONEY-BACK GUARANTEE: YOU CAN'T LOSE!
FULL MEGABYTE DISK
LIBRARY OF ANTIC SOFTWARE!

*A computerized, competitive version of the familiar word finding puzzles. The BASIC program runs on all Atari computers of any memory configuration. Antic Disk subscribers RUN "D:SCRAMBLE. BAS".*

# SCRAMBLE




by F. NEIL SIMMS

Scramble is a one-or-two player word game designed to develop vocabulary and spelling skills in a way that's entertaining for all ages. A five-by-five grid of letters is presented to each player. The object is to form words by connecting *adjacent* letters together. The longer the word, the more points you receive. The number of points required to win may be chosen by pressing the SELECT key at the beginning of the game. Words must be between three and ten letters long.

To play, first type in the listing, check it with TYPO, and SAVE an extra copy for safety.

Each player competes simultaneously by manipulating the cursor around each board with his or her joystick (plug the joysticks into ports number 1 and 2). When the cursor is positioned over the first letter of a word you have spotted, press the fire button to mark the letter. Proceed to the next letter, mark it, and so on until the word has been spelled out completely. Then position the cursor over any one of these marked letters and press the fire button again to enter the word into a string array, from which your score will later be tallied.

Remember, the letters in the sequence must be adjacent (vertically, horizontally, or diagonally). For example, in the grid below, "darling" is legal while "ding" is not. "Dared" is illegal since a specific letter may be used only once in each word.

| | | | | |
|---|---|---|---|---|
| Z | Z | E | Z | Z |
| Z | D | R | G | Z |
| Z | L | A | N | Z |
| Z | Z | I | Z | Z |
| Z | Z | Z | Z | Z |

If you make a mistake while marking the letters, enter the erroneous word anyway; it will be deleted later when the words are reviewed at the end of the round.

The program surveys each player's set of words and deletes any duplicates. That is, if you enter the word "dog" twice in the same round, the second instance will be disregarded. Any duplicates will be displayed one at a time at the top of the screen, above the appropriate player's board. Press either fire button to pause during the review process.

Each player's words are presented for acceptance or rejection. A dictionary comes in handy here. Press either joystick to the left to accept a word and add its value to the player's score, or to the right to reject a word. After scoring is completed, if the minimum winning value has been reached, a winner is declared. Otherwise a new round is begun.

*F. Neil Simms is a graduate student in Computer Science at Union College in Schenectady, New York. He started programming games on his Atari about two years ago, but now concentrates on utilities and graphics programs.*

Listing on page 57.

# WIDE TEXT

## Bold letters beef up graphics 0

by BILL MORRIS

It's been accepted as fact that you have to fold, spindle and mutilate the Atari display list in order to print bold, double-width Graphics 1 letters on a screen in the standard text mode, Graphics 0.

Even after you went through all this programming effort, you still wouldn't be allowed to put Graphics 1 letters on the same line as Graphics 0 letters. And inverse video Graphics 1 letters were completely out of reach.

WideText neatly solves all three problems. It's a short assembly language subroutine that lets you put standard or inverse Graphics 1 letters *anywhere* on a Graphics 0 screen. And you don't have to struggle with the display list.

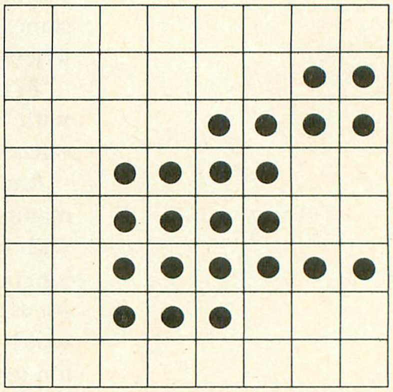
You can use the WideText subroutine in your own BASIC or machine language programs. **Antic** is publishing WideText here in a longer BASIC demonstration version. The actual subroutine is in binary load format in lines 6400-6520 and 20000-20280. We're also providing the assembly language source code for the subroutine.

*The easiest and most powerful method ever developed for inserting bold double-width Graphics 1 letters anywhere on the screen in Graphics 0, the standard text mode. Works with all Atari computers of any memory size. But if you want to use the included source code, you'll need either Atari Assembler Editor or MAC/65. Antic Disk subscribers, RUN"D:WIDETEXT.BAS"*

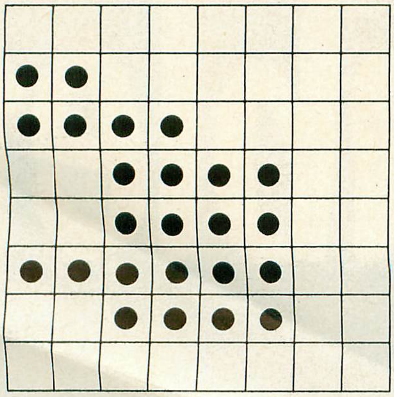
### HOW IT WORKS

WideText redefines portions of the computer's character set to simulate the Graphics 1 letters. For example, the letters [CTRL] [A] and [a] have been redefined to look like:

[CTRL] [A]



[a]



Now when [CTRL] [A] and [a] are printed next to each other, they look like an "A" in Graphics 1. It works the same way with any other letter. If you want a Graphics 1 "X," you type [CTRL] [X] and then [x]. WideText only works for letters, not with numbers, punctuation marks, or special characters.

The routine that does this is in lines 20000-20280. You can use it to mix Graphics 0 and Graphics 1 letters in your own BASIC programs. Once included in your program, you can turn it on with the statement X = USR (1536).

You can also type with WideText's simulated Graphics 1 letters. First, set the variable WIDE equal to [1]. Now as you're typing, the routine in lines 6400-6520 substitutes the wider Graphics 1 characters on the screen for each Graphics 0 letter. To type with Graphics 0 letters, set WIDE to [0].

## HOW TO USE WIDETEXT

Type in Listing 1, check it with TYPO II, and SAVE a backup copy. When you type RUN, the program will cycle through a demonstration of how WideText prints messages on the screen. You don't need to type either Listing 2 or Listing 3 in order to use Listing 1.

## USING ASSEMBLY LANGUAGE WIDETEXT

Listing 2 is the WideText assembly language source code. To use it you need either an Atari Assembler Editor or O.S.S. MAC/65 cartridge. SAVE a backup copy after you type it in. Antic Disk subscribers, ENTER #D:WIDETEXT.ASM

Once a machine language program is assembled and you SAVE it as object code, it can become part of a BASIC program if it starts with a PLA instruction and ends with an RTS instruction.

Before BASIC can use object code, the code must be converted into DATA statements. Listing 3 will load the converted object code by POKEing this data into memory.

First, save the assembled machine code on a disk by typing SAVE #DPAGE6.OBJ<600,6FF

MAC/65 owners, type:

ASM,,#D:PAGE6.OBJ

If you wish to save the source code too, type:

LIST #D:WIDETEXT.ASM

Next, turn off the computer. Then reboot it with BASIC DOS. Use option L to load the machine-language routine into Page Six.

Exit DOS and use Listing 3, the PEEKER program, to generate the necessary DATA statements. Type in Listing 3, check it with TYPO II and SAVE a backup copy before you RUN it. Antic Disk subscribers, follow the applicable instructions above *before* using the DATA statements it generates.

IMPORTANT: Remember to delete the PEEKER program before using the DATA statements it generates.

Listing on page 59.

## ASSEMBLY LANGUAGE TAKE-APART

This take-apart is for Listing 2, the assembly language source code of the DATA statements in Listing 1.

130-190 Sets the variables. Page Zero locations must be chosen carefully, since few are safe from BASIC.

200 Holds the starting address.

210 The PLA at the beginning of a machine-language subroutine exposes the Return-To-Basic address on the 6502 stack.

220-370 Finds a 1K block of memory just below the bottom of screen memory and copies a slightly modified version of the ROM character set.

410-420 Stores unchanged copies of numerals and punctuation marks.

430-440 Stores unchanged versions of capital letters.

450 Uses the variable ONECHAR to store an extra copy of each value.

460-500 Shifts all bits in ONECHAR four places to the right, and stores the value in HALFCHAR.

510-520 Delete the leftmost four bits of ONECHAR.

530-540 Calls a subroutine that expands four-place bit patterns into eight-place bit patterns. Then, this new byte is stored as a control character. Eight of these bytes will form the right half of a wide letter.

550-580 Deletes the leftmost four bits of HALFCHAR, stretches the patterns to eight bits, and stores this new byte as a lower case letter. Eight of these bytes will form the left half of a wide letter.

590-620 Repeats character-redefining steps 208 times until we have a new alphabet. (26 letters x 8 bytes per letter = 208.)

630-730 Finishes copying and storing the character set.

740-750 Updates the character base pointer, 756 ($02F4).

760 Contains the "Return from Subroutine" (RTS) instruction.

*Bill Morris is a San Francisco taxi driver. He just walked into* ***Antic*** *one day with the WideText program. He also showed us his outstanding almost-finished machine language action game called Taxicab Hill.*

# Touch Tablet

*Control the cursor in your own BASIC programs with a KoalaPad or Atari Touch Tablet. Perfect for selecting menu options or educational quiz answers. The program works on all Atari computers of any memory size. Antic Disk subscribers, RUN "D:KOALA.BAS"*

Here is an idea whose time has come: Touch tablets are the best off-keyboard controller devices.

Various computer magazines have recently pointed out that the touch tablet is a lot easier and more natural to handle than the joystick, paddle, track-ball, custom keypad—or even those highly-touted and expensive newcomers, the mouse and the touch-screen. And just as **Antic** went to press, Koala Technologies Corp. unveiled an over-$150 KoalaPad business applications controller for the higher-priced microcomputers.

This program lets you use the same principle with your Atari. You can incorporate Touch Tablet Controller into any BASIC program where the user must point to specific places on the screen. There's no reason why your KoalaPad or Atari Touch Tablet must be limited exclusively to graphics input.

Your computer "sees" the tablet as a pair of game paddles. The position of the stylus on the tablet's flat surface is defined by horizontal and vertical coordinates. The horizontal coordinate is read as PADDLE (0) and the vertical coordinate as PADDLE (1).

Similarly, the two touch tablet buttons are treated as game paddle trigger 0 (left button) and 1 (right button). Touch tablet buttons can also be read with the STICK (0) function as follows:

| | | |
|---|---|---|
| STICK (0) | = 15 | No buttons pressed |
| | = 11 | Left tablet button |
| | = 7 | Right tablet button |
| | = 3 | Both tablet buttons |
| | = 14 | Touch Tablet Stylus |
| | = 10 | Stylus + left button |
| | = 6 | Stylus + right button |
| | = 2 | Stylus + both buttons |

Unlike joysticks or game paddles, touch tablets can get from point A to point B while skipping all points in-between—not unlike a disk drive. We'll use this feature to create a tablet-controlled cursor. We'll also demonstrate how to use this cursor to choose options from menus and select answers in educational quizzes.

After you have used Touch Tablet Controller for a while, you'll probably think of other applications it can be adapted for. Please write to **Antic** about your discoveries, so other readers can share them.

## USING THE PROGRAM

Type in the program, check it with TYPO II and SAVE a backup copy.

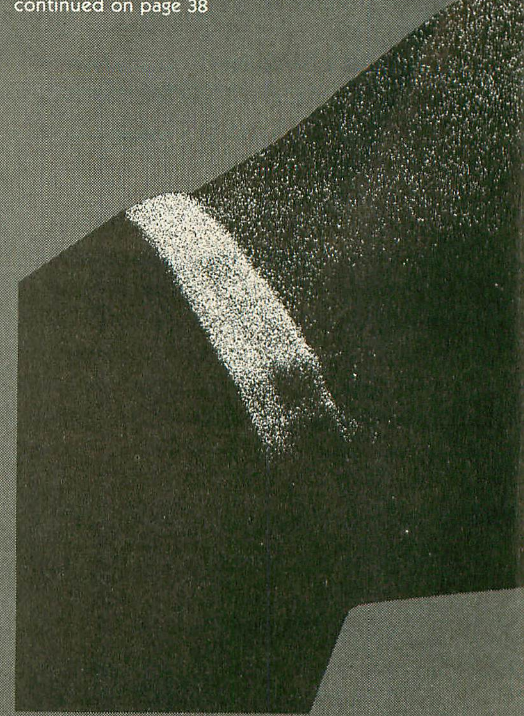
If you are using an Atari Touch Tablet: At the start of line 70 you must [DELETE] 70 REM (which will give you a substituted line 60). Also, in line 40 change 1593 to 1596. Press [RETURN] after making each of these changes.

Now plug your KoalaPad or Atari Touch Tablet into joystick port 1 and type RUN.

There is a brief delay while the program starts. You will see a menu display with four options. Press the stylus against the touch tablet and a diagonal arrow appears on the screen. The arrow's color continuously pulses and changes.

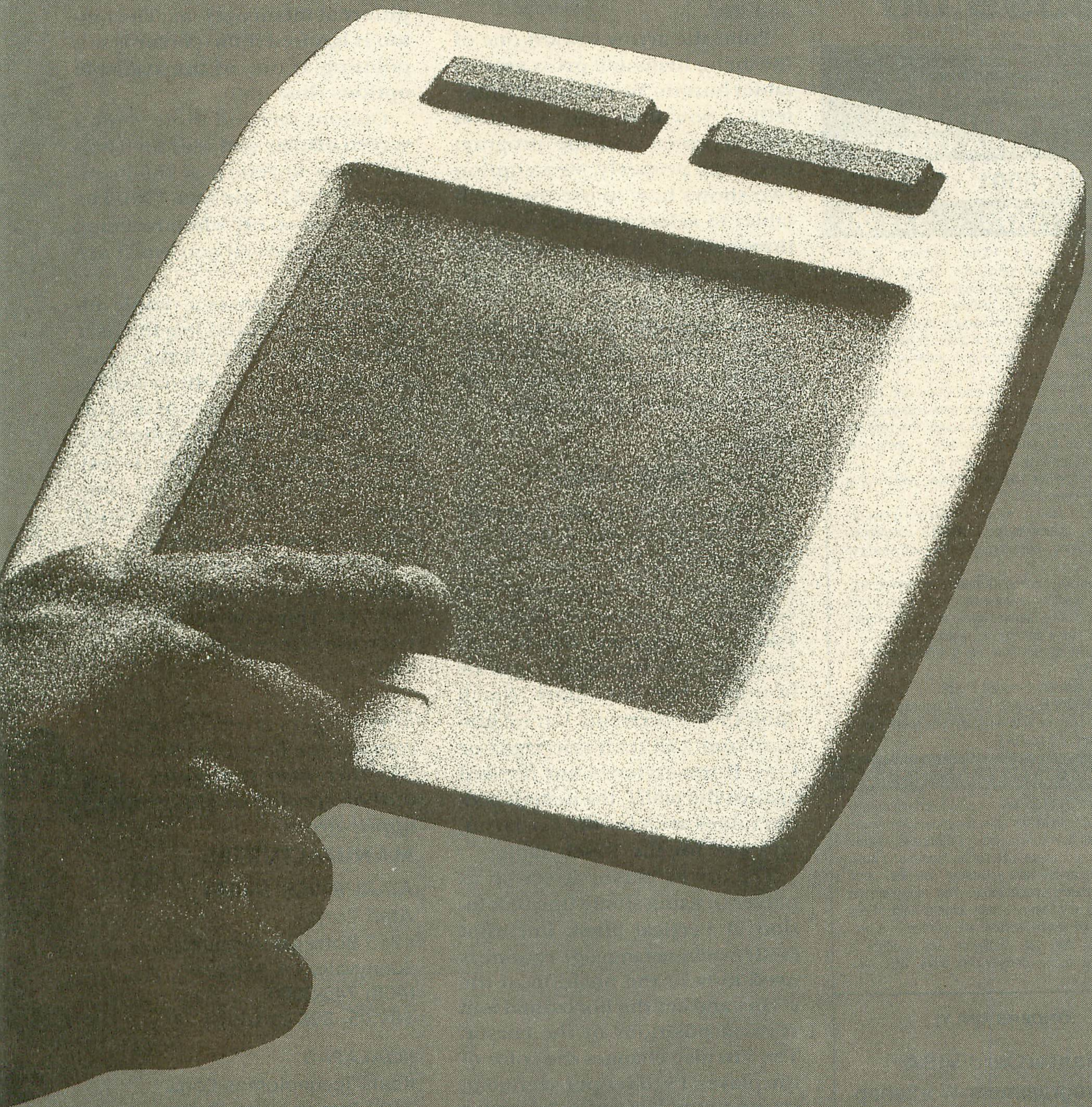
This arrow is your cursor. You can move the cursor around the

continued on page 38



# Cursor

by KARL WIEGERS



## *Mightier than a mouse!*

TOUCH TABLET CURSOR
continued from page 36


screen by sliding the stylus on the touch tablet. Lift the stylus and the cursor disappears.

The cursor will not be visible when the stylus is near the left or right edges of the tablet. This happens because most TV sets are only able to display horizontal coordinate values between 48 and 210.

Point the arrow toward one of the menu items and press a touch tablet button. You'll see a display telling you that your selection was accepted and the program branched properly. Menu option two shows how to use the touch tablet to select answers to questions printed on the screen. Press any touch tablet button to return to the main menu.

This example illustrates how easily a touch tablet can be used to indicate screen positions and accept input from the user.

## HOW THE PROGRAM WORKS

In BASIC, paddles 0 and 1 are read by PEEKing memory locations 624 and 625. The range of possible values for horizontal and vertical coordinates on the KoalaPad are 3 (extreme left or top) through 228 (extreme right or bottom). For the Atari Touch Tablet it's 9 (extreme left or bottom) and 228 (extreme right or top). If the stylus is not pressed against the tablet, the default paddle values are 3 for the KoalaPad, and 228 for the Touch Tablet.

The arrow cursor is set up as player 0, using single line resolution. A vertical blank interrupt (VBI) machine language routine is used to read the position of the stylus and set the horizontal and vertical positions of the cursor. The VBI also changes the color of the player 15 times per second to create the pulsing effect. Using a VBI like this allows the touch tablet to be read frequently without interfering with the rest of the BASIC program. The VBI routine is turned on in line 370 with the statement A = USR(1536), and can be turned off with A = USR(AD).

Lines 260-310 set up a simple menu in Graphics 1. Line 400 loops until one of the touch tablet buttons is pressed. Lines 420-450 evaluate the vertical position of the stylus (PEEK(205)) and branch to appropriate routines for the different menu options. The button is ignored if the cursor is not pointing at one of the available options (line 460).

Options one and three show a screen display and wait for a button press to return to the menu (lines 470-520 and 680-730). The VBI is turned off when reaching these displays, so you won't see the arrow.

Option two poses a simple addition question and lets the user select an answer with the stylus and button. Line 590 evaluates the vertical coordinate of the cursor, and line 600 judges the horizontal coordinate. The empty FOR-NEXT loops keep the computer from reading the touch tablet button too rapidly.

The QUIT option in the menu goes to an exit routine at lines 740-760. This removes the cursor from the screen and turns off the VBI.


*Karl Wiegers is a Ph.D. research chemist for Kodak in Rochester, NY. He's also a regular Antic author, specializing in graphics applications.*


## MANUFACTURERS

ATARI TOUCH TABLET
Atari Corp.
1265 Borregas Avenue
Sunnyvale, CA 94086
(408) 745-2000
$89.95, 32K-cartridge

KOALAPAD
Koala Technologies Corp.
3100 Patrick Henry Drive
Santa Clara, CA 95050
(408) 986-8866
$125, 32K-cartridge, 48K-disk


Listing on page 61.

*DISKIO is a superb enhancement for DOS 2.0S. For openers, it provides access to nearly all the DOS functions directly from BASIC or Atari Assembler Editor. It also has an* alphabetical *disk directory display and needs only a few keystrokes for disk file operations. DISKIO works on any Atari computer with one or more disk drives. Antic Disk subscribers, RUN "D:DISKIO.BAS".*

The day DISKIO arrived at **Antic** it became our in-house disk utility. It's that good!

DISKIO is a disk operations program that resides safely in memory and provides access to nearly all of the functions of DOS 2.0S directly from BASIC or from the Atari Assembler Editor cartridge. A number of similar "miniDOS" programs have appeared in various articles, but DISKIO removes the need for DUP.SYS more completely than any of these.

Moreover, DISKIO has a number of features that make it outstandingly easy to use, such as a two-column listing of the disk directory that is *alphabetized* and numbered, shortened commands that use those numbers, and a HELP menu that makes nearly everything self-explanatory.

Incredibly, that's not all! DISKIO also verifies potentially destructive commands, prevents renaming to an existing name, and is full compatible with the Atari BASIC and Assembly Editor cartridges.

Oh yes. . .and DISKIO occupies only 3K of memory, that's 25 disk sectors compared with 42 sectors for DUP.SYS. —ANTIC ED

# DIS

## READYING DISKIO

Use a disk containing DOS 2.0S (if the DOS.SYS file is 39 sectors long it should be okay). Type in Listing 1 exactly as it appears. The program is designed to check itself, but if you use the new TYPO II, you'll be able to find typing mistakes right after typing each line. Once you have the program correctly typed in, SAVE a backup copy then RUN it. The message "READY TO CREATE AUTORUN.SYS FILE?" will be displayed. Type [Y] and DISKIO will be created on disk as AUTORUN.SYS.

## USING DISKIO

Boot your system with the disk containing the new AUTORUN.SYS file you just created, plus either Atari BASIC or Assembly Editor. DISKIO will be loaded into memory automatically. A message will be displayed indicating that DISKIO is present and suggesting that you type HELP [RETURN] to see the commands. If you do so, the HELP menu will appear on the screen:

### DISKIO COMMANDS

| | | |
|---|---|---|
| | DIR | Directory |
| | DIRn | Dir. Drive n |
| | FORMAT | Format disk |
| | WDOS | Write DOS.SYS |
| .X->LI.-> | LISTD | List to disk |
| .S->S. -> | SAVE | Save to disk |
| .E->E. -> | ENTER | Enter to mem. |
| .L->LO.-> | LOAD | Load to mem. |
| .R-> | RUND | Run disk file |
| .K-> | LOCK | Lock file |
| .U->UN.-> | UNLOCK | Unlock file |
| .N->RE.-> | RENAME | Rename file |
| .D->DEL.> | DELETE | Delete file |
| .B->BL.-> | BLOAD | Binary load |
| .M->M. -> | MOVE | Move file |

.R9 runs #9 etc. To use DOS type KILL. Reboot to restore DISKIO.

The first column of the HELP menu lists the abbreviated .C commands which allow files to be designated by number rather than by name. The second column lists the abbreviated forms of the commands, the third lists the full command names, and the fourth gives a brief definition. Type DIR [RETURN] and the disk directory will be displayed in a manner similar to the one below:

### SAMPLE DISKIO DIRECTORY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | ASMSRCH | OBJ | 002 | 8* | DUP | SYS | 042 |
| 2 | ASMSRCH | SRC | 028 | 9 | HMSG | SRC | 010 |
| 3* | AUTORUN | SYS | 025 | 10 | RNMCHK | SRC | 021 |
| 4* | DISKIO | OBJ | 025 | 11 | RTNLNTX | SRC | 004 |
| 5* | DISKIOC | SRC | 168 | 12 | SCRSRT | SRC | 051 |
| 6* | DISKIOZ | SRC | 175 | 117 FREE SECTORS | | | |
| 7* | DOS | SYS | 039 | | | | |

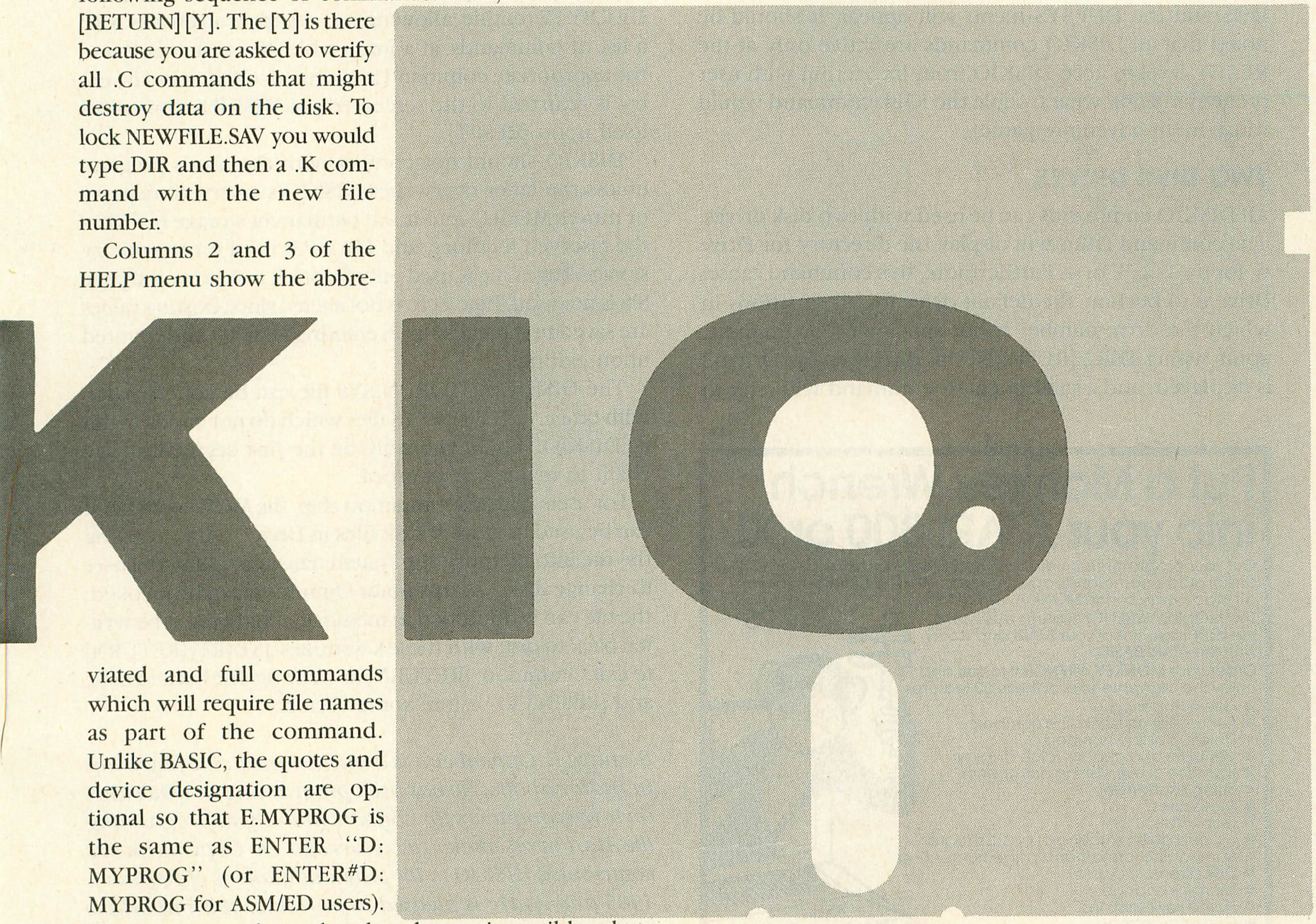
Notice that the directory is displayed in two columns, with the file names alphabetized and numbered. Up to 41 file names can be displayed simultaneously.

The DIRn command is discussed in the "Two Disk

Drives" section. The FORMAT command will format your disk after two safety prompts. The WDOS command will write DOS.SYS to the disk, but not DUP.SYS. The latter can be copied from another disk using the MOVE command (see below).

The .C commands (column 1 of the HELP menu) consist of a period, the command letter, and the file number. To use these commands the file name must be up on the screen as a result of a previous DIR command. For example, if 12*MYFILE.SAV is displayed, instead of typing RUN"D1:MYFILE.SAV [RETURN], all you have to type is .R12 [RETURN]. You can rename a file by entering the following sequence of commands: .N12,NEWFILE.SAV [RETURN] [Y]. The [Y] is there because you are asked to verify all .C commands that might destroy data on the disk. To lock NEWFILE.SAV you would type DIR and then a .K command with the new file number.

Columns 2 and 3 of the HELP menu show the abbre-




viated and full commands which will require file names as part of the command. Unlike BASIC, the quotes and device designation are optional so that E.MYPROG is the same as ENTER "D: MYPROG" (or ENTER#D: MYPROG for ASM/ED users). These commands are handy when using wildcards to manipulate more than one file: LOCK *.*. Keep in mind that with the exception of FORMAT, there is no safety prompt with these commands. If you type DEL.MYFILE, MYFILE will be deleted.

The RENAME command will not permit you to use the same name as an existing file (you know what havoc that causes!). The BLOAD command will recognize the /N suffix (even in the .C form, like .B10/N) to bypass the initialization and run steps in the binary load process.

The MOVE command functions like the Duplicate File option in the DOS menu. The file is copied into memory, then the system pauses and the message INSERT DISK2;

# *Supercharger for Atari DOS*

by DR. BERNARD E. OPPENHIEM

continued on next page

HIT ANY KEY (S=SCREEN) is displayed. If you type [S], the file will scroll up the screen. The scrolling can be halted and resumed by entering [CTRL] [1]. If you hit any other key the file is written back to the disk under the original file name. The only limitation here is that the file must fit into the available free RAM, or else the message "OUT OF RAM" will appear and the operation will be terminated. For 48K systems a file up to 233 sectors long can be moved when there is no program in memory.

To use DUP.SYS (via the DOS command) you must first remove DISKIO by typing KILL [RETURN]. To restore DISKIO the system must be rebooted. If the system is booted with no cartridge, DISKIO will return control to DOS and the DUP.SYS menu will appear. It should be noted that all DISKIO commands are active only at the READY level to keep DISKIO from interfering with user programs (think what trouble the KILL command would cause in an adventure game).

### TWO DISK DRIVES

All DISKIO commands can be used with two disk drives. The command DIRn will display the directory for Drive n, for n=1, 2, 3, or 4. Furthermore, this command causes Drive n to become the default drive for all situations in which the drive number is not specified. For example, upon typing DIR2 [RETURN] the directory for Drive 2 is displayed, and a subsequent .C command will refer to files on that drive. FORMAT will format the disk in Drive 2 and WDOS will write DOS.SYS to it.

When using the MOVE command with two drives, only the files in drive 1 can be copied to the screen, and drive 1 files can only be moved to drive 1. However, when the directory for drive 2 is displayed, the MOVE command will automatically copy the designated file into memory, then immediately move it to drive 1 under the original file name.

### FOR ADVANCED USERS

DISKIO is located between $1CFC and $2934, and protects itself by moving up MEMLO. It revectors the screen editor's GET BYTE routine, allowing it to compare all entries with a list of commands in a jump table. If a match is found the appropriate command is executed. Otherwise the entry is returned to the screen editor. DISKIO reinitializes itself upon [RESET].

DISKIO should not conflict with the user's program unless the latter overwrites DISKIO's reserved memory or moves MEMLO into it. All permanent storage is within the reserved memory, and LBUFF is used for temporary storage. Page One is used only for stack functions and page Six is not used. Page Zero is not altered since existing values are saved in the stack upon entering DISKIO and restored upon exiting.

The DISKIO AUTORUN.SYS file can be concatenated with other AUTORUN.SYS files which do not conflict with it. DISKIO should probably be the first segment in the chain to make it reset-proof.

For users with the Omnimon chip, the MOVE command can be used to modify disk files in Drive 1. After copying the file into memory the system pauses to allow the user to change disks. At this point Omnimon can be invoked, the file can be modified in memory, and then can be written back to disk with these keystrokes: [START] [RETURN] to exit Omnimon, [RETURN] to write the file back to disk, and [RESET] to restore some vectors.

*Bernard E. Oppenheim is a nuclear medicine physician in Indianapolis. He has been programing in FORTRAN on large computers for 15 years and began programing the Atari in assembler two years ago. Dr. Oppenheim has contributed DISKIO to the public domain as of February, 1985 and **Antic** is pleased to introduce this important utility to the Atari users community.*

Listing on page 62.

# MAXIMIZE STORAGE CAPACITY ON YOUR ATARI 1050* DISK DRIVE WITH THE HAPPY 1050 MAXIMIZER™

**Now** you can store **twice** as much data on your **ATARI 1050** disk drive with this easy to install high quality plug in adapter. Requires no soldering and no permanent modifications. Runs all popular true double density programs, utilities, and operating systems.




You can upgrade your **HAPPY 1050 MAXIMIZER** to a **WARP SPEED HAPPY 1050 ENHANCEMENT™**. Improves reading and writing speed 500% and comes with the **HAPPY COMPUTERS WARP SPEED SOFTWARE™** package. Makes your **ATARI 1050** the most powerful disk drive available. Easy plug in installation lets you upgrade your **HAPPY 1050 MAXIMIZER** to **WARP SPEED at any time.**

## Take COMMAND with the HAPPY 1050 CONTROLLER™

When used with the **ENHANCEMENT** or **MAXIMIZER** allows writing on the flip side of disks without punching holes. Selects protection from writing on valuable disks. Selection can be made both from software commands and a three position switch. When used with the **ENHANCEMENT** allows both switch and software control of reading and writing speeds. Plug in installation requires no soldering. May be used without **ENHANCEMENT** or **MAXIMIZER** with manual control of write protection.

Discount prices through Dec. 31, 1984:

| | |
|---|---|
| **HAPPY 1050 MAXIMIZER** complete | $124.95 |
| **MAXIMIZER** to **ENHANCEMENT UPGRADE** (You must already have a Happy 1050 Maximizer) | $129.95 |
| **HAPPY 1050 MAXIMIZER** with factory installed **MAXIMIZER** to **ENHANCEMENT** upgrade, same as **WARP SPEED HAPPY 1050 ENHANCEMENT** | $249.95 |
| **HAPPY 1050 CONTROLLER** | $49.95 |
| **WARP SPEED HAPPY 810 ENHANCEMENT™** for 810 disk drive (supports high speed single density) | $249.95 |

Price above include free delivery in the USA. California residents add 6.5% sales tax.

*Note: ATARI 1050 is a trademark of Atari, Inc.

**HAPPY COMPUTERS, INC.**
**P.O. Box 1268, Morgan Hill, CA 95037**
**(408) 779-3830**

# Disk Drives for Your Atari



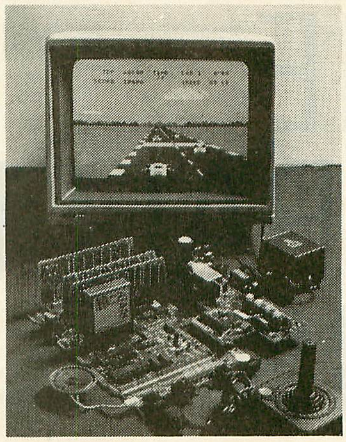
**B&C 810**

**Atari 810**

The **B&C 810** runs more software than any other disk drive made today. All electronics are interchangeable with a standard **Atari 810.** Uses the latest revision analog upgrade. Comes complete ready to plug in with a DOS games demo disk. Available with or without **Happy 810** enhancement.

**$259** B&C 810 **$449** with Happy

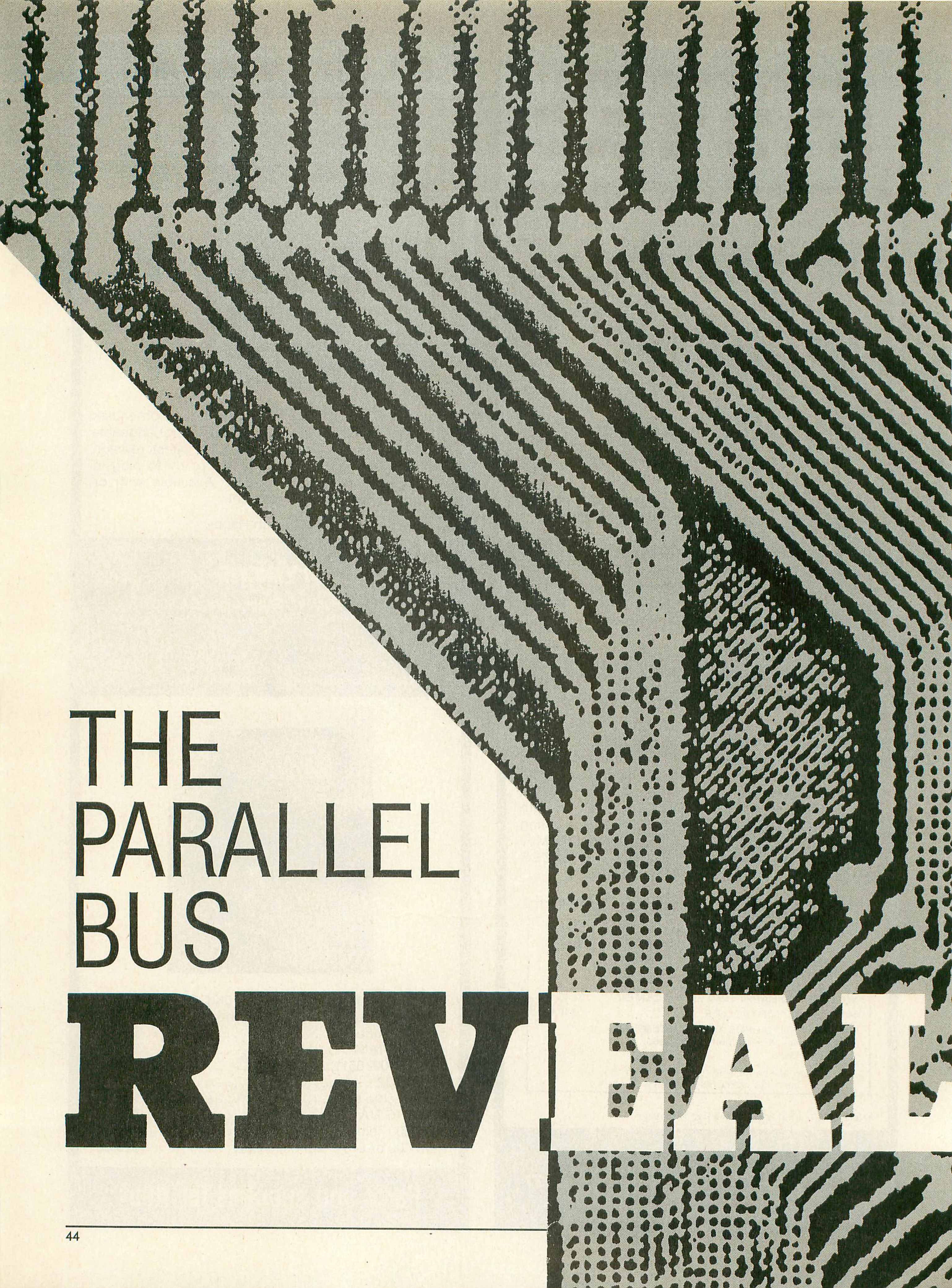
**B&C computervisions** (408) 554-0666
**3400 El Camino Real, #1, Santa Clara, CA 95051**
Normal Hours: Tuesday-Friday 10am-7pm/Sat. 10am-5pm
Xmas Hours: 7 Days a week
MC & VISA in store only
Terms: UPS Shipments free within USA for orders over $50. Add $5 if under $50. COD or prepaid. Calif. Res. add 6½% sales tax.



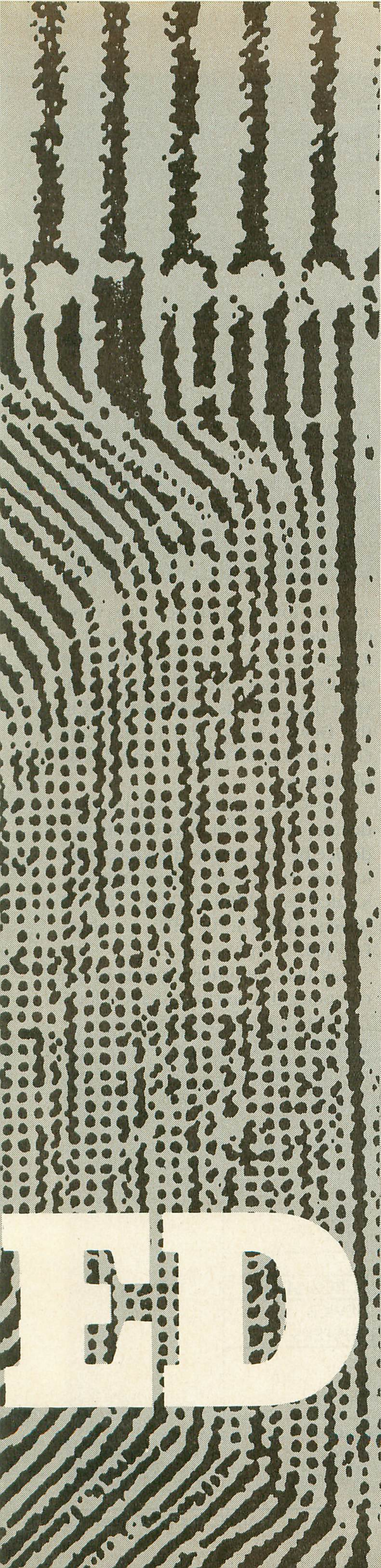
**Atari 800** spare parts kit: Main, 10K OS REVB, CPU w/GTIA, 16K RAM, power board,

| | |
|---|---|
| cable, speaker | $75 |
| less 16K RAM | $55 |
| GTIA, 6502, 6511, ANTIC, PIA, 6507, 6532, | $5 ea. |
| ROM B chip set | $10 |
| CPU w/GTIA | $20 |
| Atari 800 Tech Manual | $25 |
| Atari 800 or 810 Diagnostic Cart | $25 ea. |

# Parts and supplies for Atari



# THE PARALLEL BUS REVEAL




# 100,000 bytes per second
## Part one of a four-part series

by EARL RICE

*Until now, the Parallel Bus Interface has been one of the big mysteries of Atari XL computers. This important* **Antic** *series—by one of Atari's former top technical executives—will at last provide all the information necessary for tapping the power of this 100,000 byte per second connection.*

If you own an Atari 600XL or 800XL, you've probably noticed a little plastic cover on the back. Above that cover are the words "PARALLEL BUS." Until now, this port has only been used for memory expansion cartridges.

Then last June at the Consumer Electronics Show, the Atari company finally released full specifications for the Parallel Bus Interface (PBI). This series of articles is based on that information.

In the next few issues of **Antic**, we'll explain how the parallel bus works and how you can use it with your own projects.

### IMPORTANCE OF THE PBI

The parallel bus interface runs at the same speed as the 6502 microprocessor—and it can transfer information more than *40 times faster* than the serial connector.

The serial connector can transfer no more than 2400 bytes per second. The parallel bus can easily transfer 100,000 bytes or more per second, depending on software execution speed. This speed allows you to design controllers for hard disks and other high-speed devices.

### WHAT THE PBI IS

Basically, the parallel bus connector is an extension of the 6502 data, address, and control signals. These signals aren't buffered, and can drive only a very limited electrical load. Unmodified, there isn't very much you can do with the PBI. When used with appropriate software and hardware, however, the PBI becomes an extremely powerful extension of your computer.

Fortunately, the PBI's design is easy to understand. Additionally, most of the software you'll need is already in the Operating System. This code, called the Generic Parallel Device Handler, resides at location 58511 ($E48F), just waiting to talk to your high-speed devices. All you have to do is write the low-level hardware driver software and combine it with your hardware.

But first you need to see how the PBI works.

A parallel device *(Figure 1)* is essentially a circuit board containing five key elements:

- A ROM chip containing both the low-level driver software and a Device Handler Table.
- Any RAM required for on-board buffers.
- Some address-decoding logic.
- A hardware-select register.
- The functional circuitry itself. (Perhaps an I/O device such as a universal asynchronous receiver/transmitter (UART) to drive a modem, or a parallel interface adapter (PIA) to drive a printer.)

All device registers, ROM, and RAM are mapped into your computer's memory space as shown in the simplified memory map *(Figure 2)*.

The PBI's ROM space is mapped into the same area as the OS conversion routines from ASCII to Floating Point. The computer's memory management IC switches out the OS ROM when an external device is selected, and switches back in when it's done. The catch is that your external device can't use the floating point software in the OS. It also can't use any function of the OS or application software

continued on next page

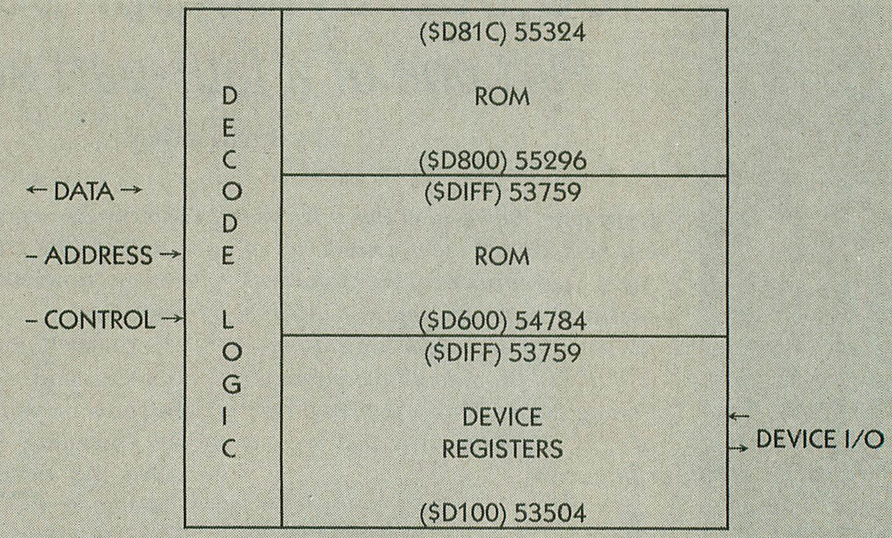



Figure 1.
**Parallel Device Block Diagram**

(like BASIC) that uses floating point routines.

Since most external devices are essentially I/O peripherals, these restrictions should not create many programming problems.

The first 26 bytes of ROM contain a data table *(Figure 3)*. This is a handler table which has the same format as the other OS vector tables. Note that some of the data is optional. The required data consists of ID bytes used by the Generic Handler to validate the presence of a parallel device, and JUMP vectors to device functions.

During a coldstart, just before attempting to initialize a cartridge, the OS will poll for parallel devices. If the ID bytes are correct, the OS will execute the JMP to the INIT routine at 55321 ($D819) through 55323 ($D81B). This routine must put the address of the Generic Handler (58511, or $E48F) into the OS handler table (HATABS) along with the device name (T:, for example).

That done, your routine sets its select bit in the Device Mask, performs any device-specific initializations and ends with an RTS instruction.

That's really all it takes to let the OS "talk" to your device. Of course, there are the low-level device drivers to consider, but we'll examine them in a later article. For now, remember that the OS simply needs to know that your device exists (have its bit set in the Device Mask) and to have the Generic Handler's address in HATABS *(Figure 4)*.

The OS can handle up to eight devices on the PBI. The OS selects a device by setting the appropriate bit in the Hardware Select register, located at 53759 ($D1FF). BIT 0 selects DEVICE 0, BIT 1 selects DEVICE 1, and so on.

Just like the other registers in the computer, this one has a shadow loca-

| | ADDRESS | OS | DEVICE |
|---|---|---|---|
| 58511 | $E48F | GENERIC HANDLER | |
| | | | |
| 55324 | $D81C | FLOATING PONT ROUTINES | 2K ROM |
| 55296 | $D800 | | |
| 55295 | $D7FF | | RAM |
| 54784 | $D600 | | |
| | | | |
| 53759 | $DIFF | | SELECT REGISTER |
| 53758 | $DIFE | | DEVICE REGISTERS |
| 53504 | $DI00 | | |
| | | | |
| 584 | $0248 | SELECT SHADOW | |
| 583 | $0247 | DEVICE MASK | |

Figure 2.
**Parallel Device Memory Map**

| | | | | | |
|---|---|---|---|---|---|
| $D800 | *ROM CHECK SUM LOW BYTE | $D80A | INTERRUPT VECTOR HIGH BYTE | $D814 | PUT BYTE VECTOR HIGH BYTE |
| $D801 | *ROM CHECK SUM HIGH BYTE | $D80B | ID NUMBER ($91) | $D815 | STATUS VECTOR LOW BYTE -1 |
| $D802 | *ROM REVISION NUMBER | $D80C | *DEVICE NAME (ASCII) | $D816 | STATUS VECTOR HIGH BYTE |
| $D803 | ID NUMBER ($80) | $D80D | OPEN VECTOR LOW BYTE -1 | $D817 | SPECIAL VECTOR LOW BYTE -1 |
| $D804 | *DEVICE TYPE | $D80E | OPEN VECTOR HIGH BYTE | $D818 | SPECIAL VECTOR HIGH BYTE |
| $D805 | JMP ($4C) | $D80F | CLOSE VECTOR LOW BYTE -1 | $D819 | JMP ($4C) |
| $D806 | I/O VECTOR LOW BYTE | $D810 | CLOSE VECTOR HIGH BYTE | $D81A | INIT VECTOR LOW BYTE |
| $D807 | I/O VECTOR HIGH BYTE | $D811 | GET BYTE VECTOR LOW BYTE -1 | $D81B | INIT VECTOR HIGH BYTE |
| $D808 | JMP ($4C) | $D812 | GET BYTE VECTOR HIGH BYTE | $D81C | *UNUSED |
| $D809 | INTERRUPT VECTOR LOW BYTE | $D813 | PUT BYTE VECTOR LOW BYTE -1 | | |

*OPTIONAL — NOT REQUIRED

Figure 3.
**ROM Vector Table**

tion. The computer uses shadow registers to update the values in its hardware registers. These values are updated 30 times per second. The Hardware Select register's shadow location is at 583 ($0247).

## SELECTING DEVICES

Before selecting a device, the OS looks at the Device Mask (location 583, $0247) to see if such a device really exists. Recall that this was the bit set by the initialization routine.

Parameters are passed between the OS and the device using the A, X and Y registers plus the Page Zero I/O Control Block (IOCB).

The carry flag tells the OS whether or not the device performed its requested function. The device sets the flag when it has performed its function. Otherwise, the carry flag is left RESET (0).

The A register passes a data byte, the X register contains the index to the originating device's IOCB, and the Y register contains a Device Status byte. This is the same as any other Central I/O (CIO) operation.

By the way, this is a good place to mention that Atari's Technical Reference Notes (C016555 Rev. A) are worth their weight in system errors. The basic operation of CIO, IOCB's, Device Status codes and the like are all presented concisely. If you are

continued on page 75

| | | |
|---|---|---|
| $031A | 'P' (PRINTER NAME) | |
| $031B | HANDLER LOW BYTE | |
| $031C | HANDLER HIGH BYTE | |
| $031D | 'C' (CASSETTE NAME) | |
| $031E | HANDLER LOW BYTE | |
| $031F | HANDLER HIGH BYTE | |
| $0320 | 'E' (EDITOR NAME) | |
| $0321 | HANDLER LOW BYTE | |
| $0322 | HANDLER HIGH BYTE | |
| $0323 | 'S' (SCREEN NAME) | |
| $0324 | HANDLER LOW BYTE | |
| $0325 | HANDLER HIGH BYTE | |
| $0326 | 'K' (KEYBOARD NAME) | |
| $0327 | HANDLER LOW BYTE | |
| $0328 | HANDLER HIGH BYTE | |
| $0329 | 0 | (T) |
| $032A | 0 | ($8F) |
| $032B | 0 | ($E4) |
| $032C | 0 | (NAME SLOT) |
| $032D | 0 | (VECTOR LOW SLOT) |
| $032E | 0 | (VECTOR HIGH SLOT) |
| $032F | 0 | |
| $0330 | 0 | |
| $0331 | 0 | |
| $0332 | 0 | |
| $0333 | 0 | |
| $0334 | 0 | |
| $0335 | 0 | |
| $0336 | 0 | |
| $0337 | 0 | |
| $0338 | 0 | |
| $0339 | 0 | |
| $033A | 0 | |
| $033B | 0 | (ALWAYS 0) |

FIND THE FIRST 0 NAME ENTRY, THEN:
PUT DEVICE NAME HERE
PUT GENERIC HANDLER ADDRESS ($E48F) HERE

Figure 4.
**Putting Your Device In HATABS**

*Say goodbye to glitchy DOS 3 forever! Convert your files back to good old DOS 2.0S. You'll need three blank disks and your DOS 3 Master Disk. You'll also need the BASIC version of Eric Verheiden's SEQDOS program from "Cassette Lookalike—Your Disk Drive" on page 81 of the July, 1984* ***Antic.***

# ESCAPE FROM DOS3

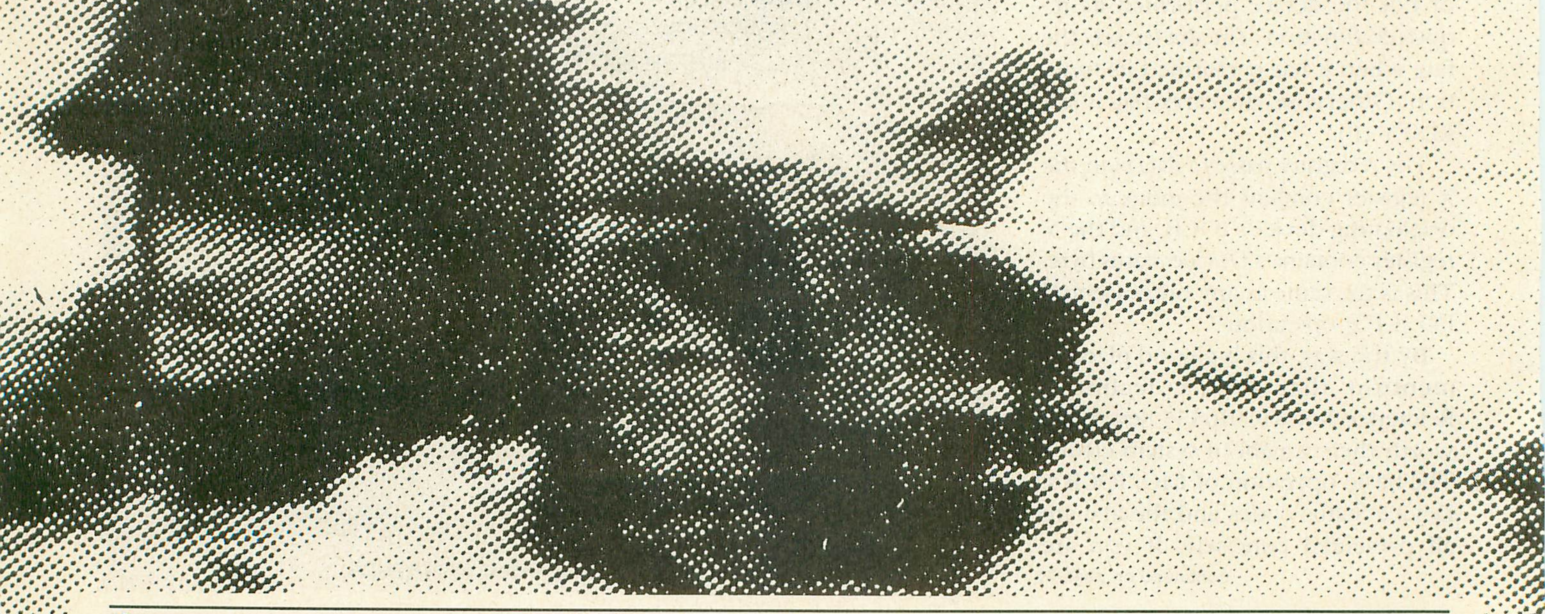
## Your files will thank you

by CHARLES JACKSON
**Antic** Staff Writer

Many Atari programmers were bitterly disappointed when they tried Atari's newest disk operating system last year. DOS 3 turned out to be flawed, slow and user-hostile.

Users had to correct the original DOS 3 versions with several obscure POKE statements from BASIC. All versions of DOS 3 store your programs in a format that is incompatible with virtually every other disk operating system. DOS 3 keeps each utility in a separate file. These utilities must be individually loaded or copied from the DOS 3 Master Disk before you can use them.

The final blow is that DOS 3 does not allow you to re-convert your programs back into DOS 2.0S after you converted them to DOS 3. Your only choice was retyping the whole program listing to SAVE on a DOS 2 disk . . . until today! continued on page 50



**ESCAPE FROM DOS 3**
continued from page 48

## PREPARING THE SEQDOS DISKS:

1. Using the SEQDOS.BAS program, prepare one SEQDOS disk with DOS 2 files, and one SEQDOS disk without DOS 2 files. (See Verheiden's article for instructions.)

2. Boot your DOS 3 Master Disk. Initialize the remaining disk with option "I." (Remember to type Y to write the FMS.SYS file.) You should also copy the KCP.SYS, KCPOVER.SYS and CONVERT.UTL files from your Master Disk to this disk.

3. Return to the DOS 3 menu and use the "A" option to convert your SEQDOS.BAS program (the one you just typed in) to DOS 3.

4. RUN the converted SEQDOS.BAS program. The computer will print:

   'PRESS RETURN TO FORMAT?"

   Then press the [BREAK] key and type DOS.

5. When the menu appears, type [S]. Then, type:

   AUTORUN.SYS [RETURN]
   600 [RETURN]
   6FF [RETURN]
   609 [RETURN]
   [RETURN]

   The computer will print:

   AUTORUN.SYS SAVED

   This is your SEQDOS + DOS 3 disk. Remove it and put a write-protect tab on it.

At this point, you should have three disks: A SEQDOS disk, a SEQDOS + DOS 2 disk, and a SEQDOS + DOS 3 disk. You're now ready to convert any BASIC program from DOS 3 to DOS 2.

## USING THE SEQDOS DISKS:

1. Boot the SEQDOS + DOS 3 disk, then insert the disk containing the program to be converted. LOAD (or ENTER) your program.

2. Insert your SEQDOS disk and type CSAVE [RETURN].

3. Boot your SEQDOS +DOS 2 disk then insert your SEQDOS disk. Type CLOAD [RETURN].

4. Your converted program is now in the computer's memory. It can be SAVEd or LISTed to any DOS 2 disk.

# SOFTWARE LIBRARY

**Antic** type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.



***DISK SUBSCRIBERS:*** You can use all these programs immediately. Just RUN the correct filenames shown at the start of each accompanying magazine article.

**Antic** Listing Credits: Gemini 10X Printer—$399 from Star Micronics, Inc., 200 Park Avenue, New York, N.Y. 10166. Lister Plus Software—$19.95 from Non-Standard Magic, P.O. Box 45, Girard, Ohio, 44420. (48K disk)

# How To Use TYPO II

Type in TYPO II and SAVE a copy to disk or cassette.

Type GOTO 32000 and follow TYPO II onscreen instructions. If the resulting two-letter line codes are not exactly the same as those in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

BASIC XL cartridge owners type SET 5,0 and SET 12,0 before using TYPO II.

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "[graphic]":POSITION 11,1:? "[inverse video]"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "[graphic]":POSITION 11,1:? "[inverse video]
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press [inverse video] and edit line a
   bove.":GOTO 32050
```

Sometimes it's not easy to tell apart the following characters, shown here in both normal and inverse video. Be especially careful when you type any of these:

| | | | | | |
|---|---|---|---|---|---|
| [graphic] | [graphic] | CTRL F | [graphic] | [graphic] | / |
| [graphic] | [graphic] | CTRL G | [graphic] | [graphic] | SHIFT + |
| [graphic] | [graphic] | CTRL N | [graphic] | [graphic] | SHIFT - |
| [graphic] | [graphic] | CTRL R | [graphic] | [graphic] | - |
| [graphic] | [graphic] | CTRL S | [graphic] | [graphic] | + |

# Typing Special Atari Characters

Shown below are the Atari Special Characters as printed in **Antic** listings—and the keys you must type in order to get them.

Whenever the CTRL key (CONTROL on XL models) or SHIFT key is used, *hold it down* while you press the next keys. Whenever the ESC key is used, *press and release* it before typing the next keys.

Turn on inverse video by pressing the Atari logo key [Atari logo] once. Turn it off by pressing a second time. (XL models use the Reverse Video Mode Key [graphic] instead.)

**NORMAL VIDEO**

| FOR THIS | TYPE THIS |
|---|---|
| [graphic] | CTRL , |
| [graphic] | CTRL A |
| [graphic] | CTRL B |
| [graphic] | CTRL C |
| [graphic] | CTRL D |
| [graphic] | CTRL E |
| [graphic] | CTRL F |
| [graphic] | CTRL G |
| [graphic] | CTRL H |
| [graphic] | CTRL I |
| [graphic] | CTRL J |
| [graphic] | CTRL K |
| [graphic] | CTRL L |
| [graphic] | CTRL M |
| [graphic] | CTRL N |
| [graphic] | CTRL O |
| [graphic] | CTRL P |
| [graphic] | CTRL Q |
| [graphic] | CTRL R |
| [graphic] | CTRL S |
| [graphic] | CTRL T |
| [graphic] | CTRL U |
| [graphic] | CTRL V |
| [graphic] | CTRL W |
| [graphic] | CTRL X |
| [graphic] | CTRL Y |
| [graphic] | CTRL Z |
| [graphic] | ESC ESC |
| [graphic] | ESC CTRL - |
| [graphic] | ESC CTRL = |
| [graphic] | ESC CTRL + |
| [graphic] | ESC CTRL * |
| [graphic] | CTRL . |
| [graphic] | CTRL ; |
| \| | SHIFT = |
| [graphic] | ESC SHIFT CLEAR |
| [graphic] | ESC DELETE |
| [graphic] | ESC TAB |

Boxes are drawn around the normal video characters here so you can see their positions more accurately, these boxes do not appear in the printed listings.

**INVERSE VIDEO**

| FOR THIS | TYPE THIS |
|---|---|
| [graphic] | [Atari logo] CTRL , |
| [graphic] | [Atari logo] CTRL A |
| [graphic] | [Atari logo] CTRL B |
| [graphic] | [Atari logo] CTRL C |
| [graphic] | [Atari logo] CTRL D |
| [graphic] | [Atari logo] CTRL E |
| [graphic] | [Atari logo] CTRL F |
| [graphic] | [Atari logo] CTRL G |
| [graphic] | [Atari logo] CTRL H |
| [graphic] | [Atari logo] CTRL I |
| [graphic] | [Atari logo] CTRL J |
| [graphic] | [Atari logo] CTRL K |
| [graphic] | [Atari logo] CTRL L |
| [graphic] | [Atari logo] CTRL M |
| [graphic] | [Atari logo] CTRL N |
| [graphic] | [Atari logo] CTRL O |
| [graphic] | [Atari logo] CTRL P |
| [graphic] | [Atari logo] CTRL Q |
| [graphic] | [Atari logo] CTRL R |
| [graphic] | [Atari logo] CTRL S |
| [graphic] | [Atari logo] CTRL T |
| [graphic] | [Atari logo] CTRL U |
| [graphic] | [Atari logo] CTRL V |
| [graphic] | [Atari logo] CTRL W |
| [graphic] | [Atari logo] CTRL X |
| [graphic] | [Atari logo] CTRL Y |
| [graphic] | [Atari logo] CTRL Z |
| [graphic] | ESC SHIFT DELETE |
| [graphic] | ESC SHIFT INSERT |
| [graphic] | ESC CTRL TAB |
| [graphic] | ESC SHIFT TAB |
| [graphic] | [Atari logo] CTRL . |
| [graphic] | [Atari logo] CTRL ; |
| [graphic] | [Atari logo] SHIFT = |
| [graphic] | ESC CTRL 2 |
| [graphic] | ESC CTRL DELETE |
| [graphic] | ESC CTRL INSERT |

See
TYPO II
Page 52

# BASIC SEARCHER

Article on page 17.

## LISTING 1

```
QC 31900 REM SEARCH UTILITY
BC 31901 REM BY SCOTT SHECK
GN 31902 REM ANTIC MAGAZINE
FR 31903 GOSUB 31907:POKE 4,1:POKE 2,PEEK
   (136):POKE 3,PEEK(137)
BL 31904 ZZ=USR(1536):IF PEEK(4)=0 THEN 3
   1925
JF 31905 A=PEEK(0)+PEEK(1)*256:IF X=10 TH
   EN LIST "P",A:GOTO 31904
GX 31906 LIST A:GOTO 31904
AW 31907 RESTORE 31908:GRAPHICS 0:IF PEEK
   (1537)<>216 THEN FOR X=1536 TO 1638:RE
   AD A:POKE X,A:NEXT X
XG 31908 DATA 104,216,160,0,177,2,133,0,2
   00,177,2,133,1,201,124,208,11,165,0,20
   1,156,208,5,160,0
RP 31909 DATA 132,4,96,200,177,2,133,204,
   200,200,177,2,197,203,208,4,32,91,6,96
   ,201,0,240,35,201,1
CX 31910 DATA 240,31,201,14,208,4,169,7,2
   08,7,201,15,208,11,200,177,2,132,206,2
   4,101,206,168,177,2,201,20
YU 31911 DATA 240,209,201,22,208,206,32,9
   1,6,76,2,6,0
QH 31912 DATA 165,2,24,101,204,133,2,144,
   2,230,3,96
SJ 31913 ? :? ,"SEARCH UTILITY":POKE 82,0
   :COUNT=128:ZZ=PEEK(130)+PEEK(131)*256:
   ? :? COUNT;" ";
MN 31914 A=PEEK(ZZ):? CHR$(A-128*(A>=128)
   );:IF A<128 THEN 31919
VI 31915 COUNT=COUNT+1:IF PEEK(ZZ+1)=90 A
   ND PEEK(ZZ+2)=218 THEN 31920
TZ 31916 IF COUNT=148 THEN POKE 82,14:POS
   ITION 14,2
KU 31917 IF COUNT=168 THEN POKE 82,28:POS
   ITION 28,2
AW 31918 ? :? COUNT;" ";
YM 31919 ZZ=ZZ+1:GOTO 31914
MR 31920 POKE 82,2:POSITION 2,23:? :? "NU
   MBER";:INPUT A:POKE 203,A:? "SCREEN OR
    PRINTER";
IK 31921 X=PEEK(764):IF X<>10 AND X<>62 T
   HEN 31921
JJ 31922 ? "↖":RETURN
WF 31923 ? "↖":? :FOR ZZ=31900 TO 31914:?
    ZZ:NEXT ZZ:? "CLR:POKE842,12:CONT";:P
   OSITION 2,0:POKE 842,13:STOP
BB 31924 ? "↖":? :FOR ZZ=31915 TO 31928:?
    ZZ:NEXT ZZ:? "CLR:POKE842,12:?CHR$(12
   5)";:POSITION 2,0:POKE 842,13:END
TQ 31925 ? :? "END OF SEARCH":? :? " AGAI
   N (Y/N) ?";:POKE 764,255
KZ 31926 IF PEEK(764)=43 THEN POKE 764,25
   5:GOTO 31900
VO 31927 IF PEEK(764)=35 THEN POKE 764,25
   5:GOTO 31923
JK 31928 GOTO 31926
```

# ERROR FILE

## OCTOBER OMISSIONS October '84

A number of division signs [/] were omitted at the printer. On the magazine pages there is an empty space where they should have appeared. Here are the specific corrections:

### *MOLE ATTACK*

Page 53
Line 20: POKE 756,S/256

Page 54
Line 1060: T=18-L/2

Page 55
Lines 1090 and 1110:
PEEK (20)0/(60)
Line 1140: 756,S/256
Line 1160:
IF AB/2<>INT (AB/2)
Line 1170: AC=1 TO AB/2
Line 1330: 756,S/256

### *PLUS MINUS*

Page 56
Line 469:
SOUND 0,40,10,N/4
Line 9020: CHBASE/256

Page 57
Line 10014:()*,./:

### *BOUNCING BALL*

Page 57
Line 110: INT(X/256)

### *ANTIC 4/5 ANIMATOR/ EDITOR*

Page 59
Line 84: A N T I C 4/5

Page 63—In an unrelated error, the following two lines were left out of listing 3:

```
2820 FOR J=1 TO 10:
     FOR I=0 TO 8
2822 K=USR(COPY
     ,48,F(10+I),AW)
```

Page 66
"HYPNO.BAS"
Line 210: ADDRESS/256)
Line 220: (BYTES/256)

### *"DEMO"*

Line 10: ERASE/PRINT

### *DIVER*

Page 69
Line 550: #6;"/"
Line 630: 0)*20)/(SK+1
Line 650: *200)/(SK+1))
Line 670: *15)/(SK+1)

continued on next page

# Q.T.

Article on page 30.

## LISTING 1

```
PT 1 REM Q.T. BY BRIAN MCWILLIAMS
NC 2 REM ANTIC MAGAZINE JUNE 1984
NH 10 DIM MOVE$(32),A$(5):LIVES=3:OFF=729
   0:C1=1:GOSUB 10000
TE 20 FOR X=C1 TO PEEK(1699):A$(X,X)=STR$
   (PEEK(1699+X)):NEXT X:HI=VAL(A$)
IK 50 COLOR 61:PLOT 0,C1:DRAWTO 19,C1:PLO
   T 0,21:DRAWTO 19,21
GM 55 PLOT 2,5:DRAWTO 17,5:DRAWTO 17,9:DR
   AWTO 2,9:DRAWTO 2,5
XF 60 COLOR 162:PLOT 0,2:DRAWTO 0,20:PLOT
    19,2:DRAWTO 19,20:COLOR 34:PLOT 4,2:D
   RAWTO 4,4:PLOT 15,2:DRAWTO 15,4
EG 70 COLOR 47:PLOT 4,11:DRAWTO 8,11:DRAW
   TO 8,15:DRAWTO 4,15:DRAWTO 4,11:PLOT 1
   1,11:DRAWTO 15,11:PLOT 13,12
WV 80 DRAWTO 13,15:PLOT 7,14:PLOT 9,16:CO
   LOR 175
HY 85 PLOT 11,15:PLOT 15,15:POSITION 3,6:
   ? #6;"antic magazine":POSITION 6,8
KO 90 ? #6;"PRESENTS":POSITION 3,18:? #6;
   "programmed  by":POSITION 2,20:? #6;"B
   RIAN MCWILLIAMS"
GJ 100 GOSUB 7000:BRD=BRD+(BRD<3)-2*(BRD=
   3):BIC=BIC+(BRD=C1):Z=50*BIC:POSITION
   C1,23:? #6;"top ";HI
IQ 105 IF BIC=7 THEN 1800
YH 125 BI=72*(BIC=C1)+74*(BIC=2)+75*(BIC=
   3)+58*(BIC=4)+86*(BIC=5)+81*(BIC=6):GO
   SUB 7020:IF BRD=C1 THEN GOSUB 1640
WM 130 GOSUB 7020:COLOR 61:PLOT 0,C1:DRAW
   TO 19,C1:DRAWTO 19,22:DRAWTO 0,22:DRAW
   TO 0,C1
OB 140 GOSUB 7100:GOSUB 7110:TIME=750-(BI
   C*50):NI=10+5*BIC:GOSUB 7130
SG 150 ON BRD GOSUB 200,800,1050
LS 160 GOTO 100
RJ 200 COLOR 47:FOR X=C1 TO 75+10*BIC
OG 210 A=INT(18*RND(0))+C1:B=INT(20*RND(0
   ))+2:LOCATE A,B,C:IF C<>32 THEN 210
GA 220 PLOT A,B:NEXT X:FOR X=C1 TO 4
FK 240 A=INT(16*RND(0))+2:B=INT(18*RND(0)
   )+3:LOCATE A,B,C:IF C>36 AND C<41 OR A
   =9 AND B=9 THEN 240
HV 250 COLOR 36+X:PLOT A,B:NEXT X:BC=42:X
   P=9:YP=10:GOSUB 7065
GX 300 IF  NOT STRIG(0) THEN GOSUB 460
KL 310 A=STICK(0):A=(A=14 OR A=10 OR A=6)
   +2*(A=7)+3*(A=13 OR A=9 OR A=5)+4*(A=1
   1):ON A GOSUB 350,420,410,440
VB 320 LOCATE C1,2,UL:LOCATE 18,2,UR:LOCA
   TE 18,21,LR:LOCATE C1,21,LL:IF UL=37 A
   ND UR=38 AND LR=39 AND LL=40 THEN 600
XW 340 GOSUB 7300:POKE 77,0:GOTO 300
QP 350 Y=-C1:X=0
GS 360 LOCATE XP+X,YP+Y,C:IF C=32 THEN GO
   SUB 7030:RETURN
PH 370 IF C=47 THEN GOSUB 7090:GOSUB 7030
   :RETURN
LQ 380 IF  NOT X THEN IF C>36 AND C<41 OR
    C=BI THEN 400
ZR 390 RETURN
KK 400 LOCATE XP+X*2,YP+Y*2,CC:IF CC=32 T
   HEN GOSUB 7040:GOSUB 7030
ZP 405 RETURN
GQ 410 Y=C1:X=0:GOTO 360
OQ 420 IF BC=43 THEN BC=42:Y=0:X=0:GOSUB
   7030:RETURN
BM 430 Y=0:X=C1:GOTO 360
PF 440 IF BC=42 THEN BC=43:Y=0:X=0:GOSUB
   7030:RETURN
UN 450 Y=0:X=-C1:GOTO 360
JC 460 C=44*(BC=42)+95*(BC=43):COLOR C:PL
   OT XP,YP
```

# ERROR FILE

### EXPLORING THE XL

June '84

There was a misprinted inverse video zero. In line 230, what appears as inverse "Or" should instead read "0r", replacing the capital letter with a zero.

### RECALL

August '84

To get this program to run, you must first 'LIST' it to disk or cassette, type 'NEW' then type: DIM QQ$(1). After this, 'ENTER' the program and it should run. 'SAVE' this version which will run from then on without the preliminaries.

### CREEPY CAVERNS

August '84

In line 10, change MO(N,5) to MO(P,5). In line 349, there is a YO(Y-ZERO) that should be YO (Y-O). The first change will prevent an error 3 and the second an error 9.

### SPACED-OUT NUMBERS

July '84

For non=XL machines, change line 31040 as follows:

```
31040 D=INT (VAL(C$)/
      INT(100∧(68-B(0))
      +1.OE-03)).
```

### MATCHBOX TIC-TAC-TOE

April '84

Change line 2078 to: 2078 CLOSE #3:RETURN

### UPDATE DISKS WITH NOTE AND POINT

April '84

Line 160 should read GOTO 600. Lines 410, 440, 470, 500 and 530 should all begin: INLEN=LEN(USER$).

### MATH WIZARD

April '84

The 17th string character in line 50 should be an inverse zero. This will genereate the proper Typo table.

See
TYPO II
Page 52

```
LQ 465 FOR X=85 TO 45 STEP -C1:SOUND 0,X,10,10:NEXT X:GOSUB OFF
UY 470 GOSUB 7065:LOCATE XP-(BC=43)+(BC=42),YP,C:IF C=32 OR C=61 THEN RETURN
IB 490 IF BC=42 THEN 520
LX 500 FOR X=XP-C1 TO C1 STEP -C1:LOCATE X-C1,YP,CC:IF CC<>32 THEN GOSUB OFF:RETURN
EY 510 SOUND 0,114-X,10,12:COLOR 32:PLOT X,YP:COLOR C:PLOT X-C1,YP:NEXT X:GOSUB OFF:RETURN
KV 520 FOR X=XP+C1 TO 18:LOCATE X+C1,YP,CC:IF CC<>32 THEN GOSUB OFF:RETURN
ZK 530 SOUND 0,114+X,10,12:COLOR 32:PLOT X,YP:COLOR C:PLOT X+C1,YP:NEXT X:GOSUB OFF:RETURN
JN 600 GOSUB 7150:FOR X=2 TO 21:LOCATE C1,X,C:IF C=32 OR C=42 OR C=43 THEN 620
JT 610 POSITION C1,X:GOSUB 640
PR 620 LOCATE 18,X,C:IF C=32 OR C=42 OR C=43 THEN 650
HM 630 POSITION 18,X:GOSUB 640:GOTO 650
UC 640 ? #6;CHR$(BI+128):GOSUB 7180:RETURN
LM 650 NEXT X:SCORE=SCORE+BONUS+TIME:GOSUB OFF:RETURN
OX 800 COLOR 32:PLOT 0,2:PLOT 0,3:PLOT 19,2:PLOT 19,3:PLOT 4,22:DRAWTO 15,22:COLOR 61:PLOT 0,4:DRAWTO 2,4:PLOT 19,4
RN 810 DRAWTO 17,4:PLOT 3,21:PLOT 16,21:PLOT 3,20:DRAWTO 16,20:COLOR 34:PLOT C1,2:PLOT C1,3
YI 820 PLOT 18,2:PLOT 18,3:PLOT 0,5:DRAWTO 0,21:PLOT 2,5:DRAWTO 2,21:PLOT 19,5:DRAWTO 19,21:PLOT 17,5:DRAWTO 17,21
GA 830 COLOR 93:PLOT 2,3:COLOR BI+128:PLOT 17,3:NM=3:NH=NM
WU 850 XP=9:YP=19:BC=42:GOSUB 7065
NB 860 FOR XX=C1 TO 11-BIC:A=STICK(0):A=(A>4 AND A<8)+2*(A>8 AND A<12)
RB 865 COLOR 62:PLOT 2,NM:ON A GOSUB 420,440:GOTO 875
OC 870 FOR A=C1 TO 10:NEXT A
YW 875 COLOR 93:PLOT 2,NM:NEXT XX
OU 880 A=INT(4*RND(0))+C1:IC=64*(A=1)+47*(A=2)+35*(A=3)+BI*(A=4):IP=INT(14*RND(0))+3
CV 885 IV=Z*(IC=BI)+50*(IC=64 OR IC=47)
ZW 890 FR=(IC=64 OR IC=58 OR IC=72 OR IC=74)+2*(IC=75 OR IC=47)+3*(IC=35 OR IC=86 OR IC=81)
GC 895 A=INT(2*RND(0))+C1:IC=IC+128*(A=2)
FF 900 FOR XX=2 TO 18 STEP FR:COLOR IC:PLOT IP,XX:A=STICK(0):A=(A>4 AND A<8)+2*(A>8 AND A<12)
VW 905 IF  NOT A THEN FOR X=C1 TO 10:NEXT X
HS 907 ON A GOSUB 420,440:COLOR 32:PLOT IP,XX
WS 910 SOUND C1,57+XX,10,9:NEXT XX:SOUND C1,0,0,0:LOCATE IP,19,C:IF C<>32 THEN IF IC=163 OR IC=35 THEN 7190
OG 920 COLOR IC:PLOT IP,18+(C=32):FOR X=C1 TO 5:NEXT X:X=IP-XP:Y=-(C<>32):GOSUB 7090:COLOR 32:PLOT XP+X,YP+Y
MJ 925 IF IC=163 OR IC=35 THEN 860
SW 930 IF C=32 THEN 1000
VV 940 COLOR 32:PLOT 17,NH:POSITION 17,NH+C1:? #6;CHR$(BI+128);CHR$(34);" ":COLOR 61:PLOT 17,NH+2:DRAWTO 19,NH+2
JQ 950 NH=NH+C1:GOSUB 7170:GOSUB OFF:SCORE=SCORE+IV
SW 960 GOSUB 7100:IF NH<19 THEN 860
MI 970 X=C1:Y=0:FOR XX=XP TO 17:GOSUB 420:NEXT XX:GOSUB 7150:FOR XX=NM TO 18:GOSUB 7160:GOSUB 7180:NEXT XX
VS 980 SCORE=SCORE+BONUS:RETURN
RM 990 GOTO 860
UZ 1000 GOSUB 7160:IF NM<19 THEN 860
IM 1020 FOR X=2 TO XP:COLOR 62:PLOT X,19:FOR Y=C1 TO 5:SOUND 0,157-X,10,10:NEXT Y:COLOR 93:PLOT X,19:GOSUB OFF
WY 1030 FOR Y=C1 TO 5:NEXT Y:COLOR 32:PLOT X,YP:NEXT X:GOSUB OFF:GOTO 7190
NE 1050 COLOR 32:PLOT C1,22:DRAWTO 18,22:COLOR 61:PLOT C1,4:DRAWTO 4,4:PLOT 15,4:DRAWTO 18,4
YE 1070 XP=4:YP=3:BC=42:GOSUB 7065
LB 1080 IF BLL THEN 1100
SQ 1090 FOR XX=C1 TO 11-BIC
KV 1095 IF  NOT NI THEN RETURN
BI 1100 POKE 77,0:GOSUB 7100:IF  NOT STRIG(0) THEN 1500
ZF 1105 FOR A=C1 TO 25:NEXT A
EN 1110 B=STICK(0):A=(B>4 AND B<8 AND BC<>92)+2*(B>8 AND B<12 AND BC<>92)+3*(B>4 AND B<8 AND BC=92)
AH 1120 A=A+4*(B>8 AND B<12 AND BC=92):ON A GOSUB 420,440,1550,1530:GOTO 1140
YC 1130 FOR A=C1 TO 15:NEXT A
CA 1140 LOCATE XP,YP+C1,C:IF C=32 AND BC<>92 THEN BC=92:GOSUB 7065
VG 1150 IF C=61 AND BC=92 THEN BC=42*(XP<5)+43*(XP>14):GOSUB 7065
LU 1160 IF C=33 OR C=161 THEN C=92:GOTO 1320
VD 1170 IF BC=92 AND YP=22 THEN 1600
OG 1180 IF STRIG(0) AND BC=92 THEN COLOR 32:PLOT XP,YP:YP=YP+C1:GOSUB 7065
WS 1190 IF  NOT BLL AND XX THEN NEXT XX:XX=0
OC 1200 IF BLL THEN 1240
EF 1210 A=INT(3*RND(0))+C1:IC=35*(A=C1)+63*(A=2)+BI*(A=3):A=INT(2*RND(0))+C1
EP 1220 BLL=33*(A=C1)+161*(A=2):IP=INT(18*RND(0))+C1:IV=10*(IC=35)+50*(IC=63)+Z*(IC=BI)
ZA 1230 FR=(IC=35)+2*(IC=63 OR IC=75 OR IC=74 OR IC=72)+3*(IC=58 OR IC=81 OR IC=86):BLLY=20
MM 1235 A=INT(2*RND(0))+C1:IC=IC+128*(A=2)
IO 1240 FOR A=BLLY-C1 TO BLLY-FR STEP -C1:LOCATE IP,A,C:IF C=32 THEN NEXT A
UB 1300 COLOR 32:PLOT IP,BLLY:DRAWTO IP,BLLY+2:BLLY=A+C1:COLOR BLL:PLOT IP,BLLY:COLOR 41:PLOT IP,BLLY+C1:COLOR IC
EG 1310 PLOT IP,BLLY+2:SOUND C1,150+BLLY,10,3:IF C=32 THEN 1080
BT 1320 COLOR 59:PLOT IP,BLLY:FOR X=10 TO 0 STEP -C1:SOUND C1,56,8,X:NEXT X:SOUND C1,0,0,0:COLOR 32:PLOT IP,BLLY
FA 1325 IF C=92 THEN SCORE=SCORE+IV
AF 1327 BLL=0:NI=NI-C1
WU 1330 COLOR 32:PLOT IP,BLLY+C1:FOR A=BLLY+3 TO 22:LOCATE IP,A,C:IF C=92 THEN COLOR 32:PLOT IP,A-C1:GOTO 1600
IM 1340 COLOR 32:PLOT IP,A-C1:COLOR IC:PLOT IP,A:SOUND 0,124+A,10,12:NEXT A:SOUND 0,0,0,0
XV 1350 COLOR 32:PLOT IP,A-C1:GOTO 1090
VT 1500 BC=92:GOSUB 7065:FOR X=0 TO 10 STEP 2:SOUND 2,150,8,X:NEXT X:COLOR 36:PLOT XP,YP:FOR X=10 TO 0 STEP -2
IH 1510 SOUND 2,150,8,X:NEXT X:LOCATE XP,YP-C1,C:IF C=32 THEN COLOR C:PLOT XP,Y
```

continued on next page

```
   P:YP=YP-C1:GOSUB 7065
XQ 1520 SOUND 2,0,0,0:GOTO 1110
OA 1530 X=-C1
OG 1535 LOCATE XP+X,YP,C:IF C<>32 THEN X=
   0
YK 1540 COLOR 32:PLOT XP,YP:XP=XP+X:GOSUB
    7065:X=0:RETURN
OP 1550 X=C1:GOTO 1535
KD 1600 FOR X=0 TO 2:SOUND X,0,0,0:NEXT X
   :COLOR 32:PLOT XP,YP
CN 1605 COLOR 61:PLOT 8,22:DRAWTO 10,22:C
   OLOR 41:PLOT 8,21:PLOT 8,20:PLOT 10,21
   :PLOT 10,20:COLOR 161:PLOT 8,19
YU 1610 PLOT 10,19:COLOR 45:PLOT 9,21:FOR
    X=21 TO 15 STEP -C1:COLOR 32:PLOT 8,X
   +C1:DRAWTO 10,X+C1
GF 1620 COLOR 61:PLOT 8,X:DRAWTO 10,X:COL
   OR 45:PLOT 9,X-C1:COLOR 41:PLOT 8,X-2:
   PLOT 10,X-2:COLOR 161:PLOT 8,X-3
HT 1630 PLOT 10,X-3:FOR Y=C1 TO 10:NEXT Y
   :NEXT X:XP=9:YP=X:GOTO 7190
TD 1640 YP=13:BC=42
GC 1645 GOSUB 7020:COLOR 32:PLOT C1,22:DR
   AWTO 18,22:COLOR BI
IZ 1647 PLOT 13+BIC,14:COLOR 42:YP=13:PLO
   T 5+BIC,YP:RESTORE 1700
MZ 1650 FOR XP=6+BIC TO 13+BIC:COLOR 32:P
   LOT XP-C1,13:GOSUB 7065:READ A,B:SOUND
    0,A,10,10:FOR X=C1 TO B:NEXT X
AZ 1660 FOR X=10 TO 0 STEP -C1:SOUND 0,A,
   10,X:NEXT X:NEXT XP:XP=XP-C1:FOR XX=C1
    TO 9:GOSUB 410:NEXT XX
BD 1670 BC=92:FOR YP=21 TO 8 STEP -C1:COL
   OR 32:PLOT XP,YP+C1:GOSUB 7065:READ A:
   SOUND 0,A,10,10:FOR X=C1 TO 2:NEXT X
HZ 1680 COLOR 36:PLOT XP,YP:FOR X=10 TO 0
    STEP -C1:SOUND 0,A,10,X:NEXT X:NEXT Y
   P:RETURN
GH 1700 DATA 68,50,102,50,76,50,114,100,1
   14,50,76,50,68,50,85,100
WD 1710 DATA 47,243,53,243,96,243,60,243,
   53,243,47,243,60,243
ZN 1800 GOSUB 7020:COLOR 34:PLOT 6,C1:DRA
   WTO 6,9:PLOT 13,C1:DRAWTO 13,9:COLOR 6
   1:PLOT 5,10:DRAWTO 14,10
EZ 1810 DRAWTO 14,12:DRAWTO 5,12:DRAWTO 5
   ,10:POSITION 6,11:? #6;"you win^":POSI
   TION 2,15:? #6;"CONGRATULATIONS^"
PS 1820 IF SCORE>HI THEN 7270
UZ 1830 GOTO 7280
LM 1840 CLR :END
DH 7000 POSITION 3,0:? #6;"PRESS  TRIGGER
   "
GS 7005 POKE 77,0:IF STRIG(0) THEN 7005
AI 7010 RETURN
GT 7020 COLOR 32:FOR X=0 TO 22:PLOT 0,X:D
   RAWTO 19,X:NEXT X:RETURN
QH 7030 COLOR 32:PLOT XP,YP:XP=XP+X:YP=YP
   +Y:GOSUB 7065:SOUND 0,57,10,10:GOSUB O
   FF:RETURN
TS 7040 COLOR 32:PLOT XP+X,YP+Y:COLOR C:P
   LOT XP+X*2,YP+Y*2:SOUND 0,217,10,10:GO
   SUB OFF:RETURN
GQ 7065 COLOR BC:PLOT XP,YP:RETURN
CV 7090 COLOR 59:PLOT XP+X,YP+Y:FOR A=C1
   TO 2:SOUND 0,68,10,4:NEXT A:FOR A=C1 T
   O 2:SOUND 0,85,10,4:NEXT A
IW 7095 GOSUB OFF:SCORE=SCORE+10*(BRD=C1)
   :RETURN
PC 7100 POSITION 2,C1:? #6;SCORE;"=":RETU
   RN
YM 7110 COLOR 170:IF LIVES THEN FOR X=C1
   TO LIVES:PLOT 14+X,C1:NEXT X:COLOR 61:
   PLOT 14+LIVES+C1,C1:RETURN
EJ 7120 COLOR 61:PLOT 15,C1:DRAWTO 17,C1:
   RETURN
ML 7130 IF BRD=C1 THEN POSITION 9,C1:? #6
   ;TIME;"="
AT 7140 RETURN
QX 7150 BONUS=0:POSITION 5,11:? #6;"bonus
    x ";Z:RETURN
OU 7160 COLOR 32:PLOT 2,NM:POSITION 0,NM+
   C1:? #6;" ";CHR$(34);"]":COLOR 61:PLOT
    0,NM+2:DRAWTO 2,NM+2:NM=NM+C1
QF 7170 FOR X=C1 TO 2:SOUND 0,128,10,15:N
   EXT X:GOSUB OFF:RETURN
IN 7180 SOUND 0,X+124,10,10:BONUS=BONUS+Z
   :POSITION 8,13:? #6;BONUS:GOSUB OFF:FO
   R A=C1 TO 25:NEXT A:RETURN
MR 7190 COLOR 45:PLOT XP,YP:RESTORE 7250:
   FOR X=C1 TO 5:READ A,B:SOUND 0,A,12,10
   :FOR Y=C1 TO B:NEXT Y
WU 7200 FOR Y=10 TO 0 STEP -C1:SOUND 0,A,
   12,Y:NEXT Y:NEXT X:LIVES=LIVES-C1:IF
   NOT LIVES THEN 7260
EG 7210 COLOR 32:PLOT XP,YP:GOSUB 7110:ON
    BRD GOTO 7230,7220,7230
QY 7220 IF NM<19 THEN 850
AQ 7230 GOSUB 7020:GOTO 130
JZ 7250 DATA 85,85,76,25,72,25,85,50,60,1
   00
LV 7260 GOSUB 7120:POSITION 4,10:? #6;"en
   d of game":IF SCORE<=HI THEN 7280
OM 7270 A$=STR$(SCORE):POKE 1699,LEN(A$):
   FOR X=C1 TO LEN(A$):POKE 1699+X,VAL(A$
   (X,X)):NEXT X
CK 7280 GOSUB 7000:GOTO 1840
RZ 7290 SOUND 0,0,0,0:RETURN
EJ 7300 TIME=TIME-C1:GOSUB 7130:GOSUB 710
   0:IF  NOT TIME THEN POP :GOTO 7190
AO 7310 RETURN
WJ 10000 RESTORE 10061:C=PEEK(106)-5:BASE
   =(C+C1)*256:POKE 559,0:POKE 106,C:GRAP
   HICS 17
XU 10010 FOR X=C1 TO 32:READ Y:MOVE$(X)=C
   HR$(Y):NEXT X:JUNK=USR(ADR(MOVE$),BASE
   ,57344):POKE 756,BASE/256
AT 10020 TRAP 10060:READ INSET:FOR X=BASE
   +INSET*8 TO BASE+INSET*8+7
EC 10030 READ CHANGE:POKE X,CHANGE:NEXT X
   :GOTO 10020
IO 10060 POKE 559,254:RETURN
TW 10070 DATA 104,104,133,215,104,133,214
   ,104,133,213,104,133,212,162,4,160,0,1
   77,212,145,214,200,208,249
LA 10075 DATA 230,213,230,215,202,208,240
   ,96
JY 10080 DATA 29,170,85,170,85,170,85,170
   ,85,2,24,126,90,66,66,90,126,24,15,0,1
   26,126,126,126,126,126,0
OK 10090 DATA 10,8,20,24,56,56,112,96,152
   ,5,0,126,70,94,94,126,126,0,6,0,126,98
   ,122,122,126,126,0
NF 10100 DATA 7,0,126,126,122,122,98,126,
   0,8,0,126,126,94,94,70,126,0,12,8,20,2
   4,58,62,112,96,152
XE 10110 DATA 13,160,0,12,68,190,127,0,0,
   11,16,40,24,28,28,14,6,25,63,16,40,24,
   92,124,14,6,25
QU 10120 DATA 27,146,84,0,198,0,84,146,0,
   26,254,254,170,138,170,254,254,0,40,12
   4,68,108,56,16,24,16,24
TI 10130 DATA 61,0,0,48,94,116,106,62,0,3
   0,0,12,56,80,96,74,62,0,32,24,60,60,12
   6,126,126,126,60
EK 10140 DATA 3,0,255,126,126,126,255,0,0
PW 10150 DATA 1,124,246,250,254,254,124,5
   6,16,9,16,16,16,16,16,16,16,16,31,104,
   88,104,92,116,56,0,0
QI 10160 DATA 60,0,195,36,24,24,36,0,0,4,
   0,0,0,126,153,36,0,0,42,24,60,36,36,12
   6,126,126,126
UQ 10170 DATA 43,16,56,124,124,124,124,25
   4,8,49,112,64,110,72,126,2,14,0,54,60,
   126,90,126,126,126,84,0
HX 10180 DATA 62,12,12,24,24,48,48,0,48
```

**bonus game**

# SCRAMBLE

Article on page 33.

See
**TYPO II**
Page 52

## LISTING 1

```
GP 10 REM SCRAMBLE
GJ 15 REM BY F. NEIL SIMMS
RG 20 REM ANTIC MAGAZINE
FF 30 GOSUB 5000:GOTO 1000:REM ** init an
   d begin **
RQ 38 REM ** time delay loop **
LQ 40 IF PEEK(540)<>0 THEN 40
ZV 50 RETURN
PZ 53 REM ** INPUT: string TP$ **
OC 54 REM ** OUTPUT: LN (nonblank LEN(TP$
   )) **
LP 55 FOR K=1 TO 10:IF TP$(K,K)=" " THEN
   LN=K-1:POP :GOTO 65
CN 60 NEXT K:LN=10
AG 65 RETURN
UO 198 REM ** move cursor **
CO 200 TX=X(PLR):TY=Y(PLR):LOCATE TX,TY,Z
   :COLOR Z-32:POKE 53760+I,I*40+40:POKE
   53761+I,168:POKE 77,0
AD 203 IF FIRST(PLR) THEN COLOR Z:FIRST(P
   LR)=0
BL 204 PLOT TX,TY
RS 205 IF ST=14 OR ST=10 OR ST=6 THEN TY=
   TY-1:IF TY<3 THEN TY=7
CT 210 IF ST=9 OR ST=5 OR ST=13 THEN TY=T
   Y+1:IF TY>7 THEN TY=3
MZ 220 IF ST>8 AND ST<12 THEN TX=TX-1:IF
   TX<3+XOFF THEN TX=7+XOFF
ZK 230 IF ST>4 AND ST<8 THEN TX=TX+1:IF T
   X>7+XOFF THEN TX=3+XOFF
PR 250 LOCATE TX,TY,Z:COLOR Z+32:PLOT TX,
   TY:X(PLR)=TX:Y(PLR)=TY
ZK 260 RETURN
GC 398 REM ** mark square or end word **
AA 400 FIRE(PLR)=1
JK 405 WD=WORDS(PLR):TX=X(PLR):TY=Y(PLR):
   LOCATE TX,TY,Z:IF Z>122 THEN 500
TJ 410 IF LT=0 THEN 480:REM ** always mar
   k square if first letter **
ZT 420 IF ABS(PREVX(PLR)-TX)>1 OR ABS(PRE
   VY(PLR)-TY)>1 THEN 600
FX 480 POKE 53760+I,I*60+60:POKE 53761+I,
   168:COLOR Z+128:PLOT TX,TY:PREVX(PLR)=
   TX:PREVY(PLR)=TY
SG 490 T$(TOFF+LT,TOFF+LT)=CHR$(Z-32):IF
   LT<9 THEN LNG(PLR)=LT+1
OO 495 GOTO 600
KY 499 REM ** square was already marked -
    process word if valid **
WM 500 IF WD>99 THEN SOUND PLR,255,10,8:G
   OTO 600:REM ** array full **
UU 505 POKE 53760+I,I*60+60:POKE 53761+I,
   168:IF LNG(PLR)<3 THEN 515:REM ** word
    is too short to count **
AP 510 AOFF=PLR*1000+WD*10:AR$(AOFF+1,AOF
   F+10)=T$(TOFF,TOFF+9):WORDS(PLR)=WD+1
UB 515 T$(TOFF,TOFF+9)=BL$
KH 520 IF  NOT PLR THEN FOR Y=3 TO 7:I=(Y
   -3)*5:POSITION 3,Y:? #6;B$(I+1,I+5):NE
   XT Y:GOTO 540
ES 530 FOR Y=3 TO 7:I=(Y-3)*5:POSITION 12
   ,10-Y:? #6;B$(I+1,I+5):NEXT Y
US 540 LNG(PLR)=0:POKE 87,1:POSITION 1+15
   *PLR,11:? #6;WORDS(PLR);
UY 550 LOCATE TX,TY,Z:COLOR Z+32:PLOT TX,
   TY
ZC 600 RETURN
ZJ 998 REM ** main play loop **
AE 1000 POKE 53761+PLR*2,0
MI 1002 IF STRIG(0) AND FIRE(0) THEN FIRE
   (0)=0
PQ 1003 IF STRIG(1) AND FIRE(1) THEN FIRE
   (1)=0
FW 1004 IF PEEK(542)<>0 THEN 1002
OX 1005 POKE 542,5:PLR= NOT PLR:XOFF=9*PL
   R:TOFF=10*PLR+1:LT=LNG(PLR):WD=WORDS(P
   LR):I=PLR*2:POKE 87,2
FM 1010 ST=STICK(PLR):IF ST<>15 THEN GOSU
   B 200:GOTO 1030
ZD 1020 T=STRIG(PLR):IF  NOT T AND  NOT F
   IRE(PLR) THEN GOSUB 400
EH 1029 REM ** update TIME **
KE 1030 TI=PEEK(540):IF TI THEN 1050
YW 1035 TIME=TIME-1
HI 1040 POKE 540,60:POKE 87,1:POSITION 9,
   11:? #6;TIME;"  ":IF  NOT TIME THEN 12
   00
HS 1050 GOTO 1000:REM ** end of main loop
    **
SA 1198 REM ** end of round **
NL 1200 GOSUB 2700:FOR I=10 TO 0 STEP -0.
   3:POKE 53279,0:POKE 540,I:GOSUB 40:NEX
   T I
OT 1205 POKE 87,2:POSITION 5,0:? #6;"dupl
   icates:":FOR L=0 TO 1
GH 1210 IF WORDS(L)>1 THEN PLR=L:GOSUB 30
   00
GG 1220 NEXT L
GI 1230 IF WORDS(0)<1 OR WORDS(1)<1 THEN
   1240
LL 1235 GOSUB 2800:POSITION 5,0:? #6;" ma
   tches:  ":GOSUB 3300
PA 1240 GOSUB 2800:POSITION 1,9:? #6;"acc
   ept < > reject"
YK 1250 POSITION 5,0:? #6;" scoring:  ":F
   OR L=0 TO 1:PLR=L:GOSUB 3500:NEXT L
UI 1260 POSITION 0,0:FOR I=0 TO 9:? #6;BL
   $;BL$;:NEXT I:POSITION 1,4:? #6;"scori
   ng completed":POKE 540,200:GOSUB 40
PW 1270 IF SCORE(0)<WIN AND SCORE(1)<WIN
   THEN 1300:REM ** skip following if not
    end of game **
PK 1280 IF SCORE(0)>SCORE(1) THEN WINNER=
   0:GOTO 1295
CT 1285 IF SCORE(0)=SCORE(1) THEN 1297
WM 1290 WINNER=1
YF 1295 POSITION 2,6:? #6;"player #";WINN
   ER+1;" wins!":GOTO 1298
LJ 1297 POSITION 5,6:? #6;"it's a tie!"
RY 1298 FOR I=50 TO 250 STEP 3:POKE 540,0
   :GOSUB 40:SOUND 0,I,10,6:SOUND 1,300-I
   ,10,6:NEXT I:GOSUB 2700:GOTO 1500
OC 1300 GOSUB 4000:GOSUB 2000:GOSUB 2500:
   ROUND=ROUND+1:POKE 87,1:POSITION 13-1*
   (ROUND>9),13:? #6;ROUND;:GOSUB 2600
ZA 1340 GOTO 1000:REM ** start next round
    **
```

continued on next page

```
0270  STA $47 ; LO BYTE LOWER CASE
0280  SEC
0290  LDA $59 ; PAGE # SCREEN MEMORY
0300  SBC #1
0310  STA $48 ; PAGE # LOWER CASE
0320  SBC #1
0330  STA $CF ; PAGE # CONTROL CHARS
0340  SBC #1
0350  STA $CD ; PAGE # CAPS
0360  SBC #1
0370  STA $46 ; PAGE # NUMBERS
0380  LDY #0  ; SET COUNTER
0390 ;   BEGIN SPREADING LETTERS,
0400 ;ONE BYTE AT A TIME
0410 START LDA $E000,Y ; COPY NUMBERS
0420  STA (NUMBERS),Y ; STORE THEM
0430  LDA $E100,Y  ; COPY CAPS
0440  STA (CAPS),Y ; STORE UNCHANGED
0450  STA ONECHAR ; MAKE EXTRA COPY
0460  LSR A     ; SHIFT LEFT
0470  LSR A     ; NYBBLE INTO
0480  LSR A     ; RIGHT NYBBLE,LEAVING
0490  LSR A     ; LEFT NYBBLE EMPTY
0500  STA HALFCHAR ; FILE IT AWAY
0510  LDA ONECHAR ; THAT EXTRA COPY
0520  AND #$0F     ; KILL LEFT NYBBLE
0530  JSR BIT3  ; SPREAD RIGHT NYBBLE
0540  STA (CONTROL),Y ; STORE RIGHT
0550 ;  HALF OF NEW LETTER
0560  LDA HALFCHAR ; GET OTHER HALF
0570  JSR BIT3 ; SPREAD IT
0580  STA (LOWER),Y ; STORE LEFT HALF
0590  INY ;COUNTER = COUNTER +1
0600  CPY #26*8 ; 8 BYTES TO A LETTER
0610 ;         26 LETTERS TO AN ALPHABET
0620  BNE START ; NEXT Y
0630 FINISH LDA $E000,Y ;STORE
0640  STA (NUMBERS),Y    ;MISC.
0650  LDA $E100,Y        ;CHARACTERS
0660  STA (CAPS),Y       ;UNCHANGED
0670  LDA $E200,Y
0680  STA (CONTROL),Y
0690  LDA $E300,Y
0700  STA (LOWER),Y
0710  INY
0720  CPY #$FF        ; DONE
0730  BNE FINISH
0740  LDA $46    ; FIRST PAGE # NEW SET
0750  STA CHBAS ; POKED INTO POINTER
0760  RTS ; RETURN TO BASIC, BYE BYE
0770 ;
0780 ;   SUBROUTINE TO SPREAD HALF
0790 ;   A BITE INTO THE FULL BYTE
0800 ;
0810 BIT3 TAX ; SAVE A COPY
0820  AND #8  ; SEE IF BIT 3 IS ON
0830  CMP #8  ;    00001000
0840  BNE BIT2; IF NOT GOTO BIT2
0850  TXA       ; GET THE COPY
0860  CLC       ;
0870  ADC #$B8; BIT 3 OFF, 6 & 7 ON
0880 ;             11000000
0890  JMP CLR2 ; BYPASS NEXT LINE
0900 BIT2 TXA ; GET UNALTERED COPY
0910 CLR2 TAX ; STASH LATEST VERSION
0920  AND #4  ; SEE IF BIT 2 IS ON
0930  CMP #4  ;    00000100
0940  BNE BIT1; IF NOT, THEN BIT1
0950  TXA
0960  CLC
0970  ADC #$2C  IF SO, DO THIS
0980  JMP CLR1;    00110000
0990 BIT1 TXA
1000 CLR1 TAX
1010  AND #2     ; BIT 1?
1020  CMP #2     ; 00000010
1030  BNE BIT0
1040  TXA
1050  CLC
1060  ADC #$0A  ; BECOMES
1070  JMP CLR0  ; 00001100
1080 BIT0 TXA
1090 CLR0 TAX
1100  AND #1     ; 00000001
1110  CMP #1
1120  BNE BIT86
1130  TXA
1140  CLC
1150  ADC #$02  ; 00000011
1160  JMP CLR86
1170 BIT86 TXA
1180 CLR86 RTS  ; RETURN
```

## LISTING 3

```
HE 10 REM PEEKER
YY 20 REM BY BILL MORRIS
RH 30 REM ANTIC MAGAZINE
BX 40 X=20010:REM DATA STATEMENTS WILL ST
   ART WITH THIS LINE NUMBER
NM 50 FOR A=1536 TO 1701 STEP 6
DX 60 ? CHR$(125):POSITION 2,6
VE 70 ? X;" DATA ";
SD 80 ? PEEK(A);",";
FJ 90 ? PEEK(A+1);",";
TH 100 ? PEEK(A+2);",";
TX 110 ? PEEK(A+3);",";
UN 120 ? PEEK(A+4);",";
RX 130 ? PEEK(A+5)
GU 140 POSITION 2,0:POKE 842,13:POSITION
   2,7:? "CONT"
FX 150 POSITION 2,4:STOP
MM 160 POKE 842,12
PY 170 X=X+10
DF 180 NEXT A
OI 190 END
```

mightier than a mouse

# TOUCH TABLET CURSOR

Article on page 36.

See TYPO II Page 52

## LISTING 1

```
YU 10 REM KOALA CURSOR DEMONSTRATION
BX 20 REM BY KARL E. WIEGERS
RH 30 REM ANTIC MAGAZINE
EH 40 AD=1593:REM AD=1596 FOR ATARI TOUCH
   TABLET.
DZ 50 DATA 104,169,7,162,6,160,10,76,92,2
   28,173,112,2,141,0,208,160
MA 60 DATA 6,169,0,145,205,136,16,251,173
   ,113,2,133,205,160,0,177,203
AL 70 REM 60 DATA 6,169,0,145,205,136,16,
   251,169,228,56,237,113,2,133,205,160,0
   ,177,203
IR 80 REM FOR TOUCH TABLET, USE THE ABOVE
   DATA LINE IN PLACE OF LINE 60.
VE 90 DATA 145,205,200,192,7,208,247,165,
   20,201,4,208,7,206,192,2,169
IT 100 DATA 0,133,20,76,98,228,104,160,98
   ,162,228,169,7,76,92,228
RR 110 REM RESERVE 8 PAGES OF RAM FOR PM
   GRAPHICS
BY 120 RAMTOP=PEEK(106)-8
HM 130 PMBASE=RAMTOP*256
OH 140 POKE 106,RAMTOP-4
YX 150 GRAPHICS 17
MS 160 POKE 54279,RAMTOP
LR 170 POKE 559,0
DX 180 REM LOAD VERTICAL BLANK INTERRUPT
   ROUTINE INTO PAGE 6
KN 190 FOR I=1 TO (AD-1526):READ A:POKE 1
   535+I,A:NEXT I
FD 200 FOR I=PMBASE+1024 TO PMBASE+1279:P
   OKE I,0:NEXT I
SV 210 POKE 203,0:POKE 204,RAMTOP
GW 220 POKE 205,0:POKE 206,RAMTOP+4
RV 230 REM LOAD PLAYER DATA
YL 240 FOR I=0 TO 6:READ A:POKE PMBASE+I,
   A:NEXT I
VC 250 DATA 128,64,32,20,12,30,6
ZA 260 GRAPHICS 17
HM 270 POSITION 4,1:? #6;"*** MENU ***"
JK 280 POSITION 5,5:? #6;"menu item 1"
WM 290 POSITION 5,7:? #6;"menu item 2"
IR 300 POSITION 5,9:? #6;"MENU ITEM 3"
CJ 310 POSITION 8,11:? #6;"QUIT"
BV 320 REM TURN ON PMG AND INITIALIZE TIM
   ER
RN 330 POKE 559,62
VM 340 POKE 53277,3
EM 350 POKE 20,0
AD 360 REM TURN ON VBI ROUTINE. TO TURN I
   T OFF, USE A=USR(AD)
YW 370 A=USR(1536)
OZ 380 FOR I=1 TO 100:NEXT I
EA 390 IF STICK(0)=15 THEN 390
NZ 400 IF PEEK(205)>63 AND PEEK(205)<74 T
   HEN GOTO 450
MM 410 IF PEEK(205)>79 AND PEEK(205)<90 T
   HEN GOTO 520
TS 420 IF PEEK(205)>95 AND PEEK(205)<106
   THEN GOTO 680
KK 430 IF PEEK(205)>111 AND PEEK(205)<122
   THEN GOTO 750
QG 440 GOTO 390
VH 450 GRAPHICS 18:POKE 559,62:POKE 53248
   ,0
GU 460 A=USR(AD)
PW 470 POSITION 4,3:? #6;"AT OPTION ONE"
CQ 480 POSITION 2,7:? #6;"PRESS BUTTON FO
   R":? #6;"          MENU"
PC 490 FOR I=1 TO 100:NEXT I
WI 500 IF STICK(0)=15 THEN 500
OK 510 GOTO 260
PI 520 GRAPHICS 2:POKE 559,62:POKE 752,1
LV 530 POKE 708,88:POKE 709,0:POKE 710,19
   8
RZ 540 POSITION 6,2:? #6;"7 + 5 = ?"
FA 550 POSITION 4,6:? #6;"10  12  2  16"
XU 560 ? " Point to answer and press butt
   on"
DW 570 IF STICK(0)=15 THEN 570
QL 580 LM=16050-10*AD
RF 590 IF PEEK(625)<LM OR PEEK(625)>LM+17
    THEN 570
PG 600 IF PEEK(624)>99 AND PEEK(624)<121
   THEN GOTO 620:REM PADDLE(0)
WP 610 POSITION 3,0:? #6;"SORRY-TRY AGAIN
   ":FOR I=1 TO 50:NEXT I:GOTO 570
UV 620 POSITION 3,0:? #6;"   CORRECT!!
   "
RM 630 POSITION 14,2:? #6;"12"
WW 640 ? "↖        PRESS BUTTON FOR MENU"
OW 650 FOR I=1 TO 100:NEXT I
DU 660 IF STICK(0)=15 THEN 660
OX 670 GOTO 260
VP 680 GRAPHICS 18:POKE 559,62:POKE 53248
   ,0
HC 690 A=USR(AD)
ZA 700 POSITION 3,3:? #6;"AT OPTION THREE
   "
CF 710 POSITION 2,7:? #6;"PRESS BUTTON FO
   R":? #6;"          MENU"
OR 720 FOR I=1 TO 100:NEXT I
BO 730 IF STICK(0)=15 THEN 730
OS 740 GOTO 260
DZ 750 POKE 53248,0:A=USR(AD)
XK 760 POKE 106,PEEK(106)+12
ZK 770 POKE 559,3:GRAPHICS 0:END
```

# DISKIO

Article on page 40.

## LISTING 1

```
OL 1 REM DISKIO VERSION 4.3 -- BY BERNARD
    OPPENHEIM. ANTIC, JANUARY,1985. PUB
   LIC DOMAIN. REQUIRES DOS 2.05.
XN 2 DIM DAT$(114),CH$(2):K32=32768:IF PE
   EK(1693)=255 THEN 10
EN 3 FOR I=1 TO 158:READ X:POKE 1535+I,X:
   NEXT I
NV 4 DATA 104,104,104,133,205,104,104,170
   ,104,133,204,104,133,203,24,165,203,10
   1,205,133,203,144,2,230,204,160
NC 5 DATA 0,177,203,133,212,200,177,203,1
   33,213,48,72,232,228,212,240,10,134,21
   2,165,213,9,128,133,213,208,57
KS 6 DATA 200,177,203,133,205,56,233,3,13
   3,206,169,0,168,74,144,2,9,128,81,203,
   200,196,206,144,244,133,207,74,74
QO 7 DATA 74,74,201,10,144,3,24,105,7,105
   ,48,209,203,208,13,200,200,196,205,240
   ,167,136,165,207,41,15,16,230,96
XL 8 DATA 104,104,133,204,104,133,203,160
   ,0,132,213,177,203,56,233,48,201,10,14
   4,2,233,7,10,10,10,10,133,212
PT 9 DATA 200,177,203,56,233,48,201,10,14
   4,2,233,7,24,101,212,133,212,96,0
PJ 10 GOSUB 19:LN=USR(1536,LEN0,LINE0,ADR
   0):IF LN<K32 THEN POKE 1693,255:LIST L
   N:END
ZK 11 IF LN>K32 THEN POKE 1693,255:LN=LN-
   K32:? "LINE ";LN;" IS MISSING":END
BM 12 ? "READY TO CREATE AUTORUN.SYS FILE
   ?";:CLOSE #1:OPEN #1,4,0,"K:":GET #1,X
   :IF X<>89 THEN END
RW 13 CLOSE #1:OPEN #1,8,0,"D:AUTORUN.SYS
   ":RESTORE 20:CHADR=ADR(CH$):TRAP 18
QD 14 READ DAT$:L=LEN(DAT$)-2:IF ASC(DAT$
   )>47 THEN IF ASC(DAT$)<71 THEN 17
GQ 15 FOR I=1 TO L:CH$=DAT$(I):X=ASC(CH$)
   :IF X=33 THEN X=155
XO 16 PUT #1,X:NEXT I:GOTO 14
BZ 17 FOR I=1 TO L STEP 2:CH$=DAT$(I):X=U
   SR(1647,CHADR):PUT #1,X:NEXT I:GOTO 14
YK 18 CLOSE #1:END
VS 19 ADR0=PEEK(138)+256*PEEK(139):LINE0=
   PEEK(ADR0):LEN0=PEEK(ADR0+2):RETURN
WQ 20 DATA FFFF0C1D342968AD01A0C9CAF009C9
   08D06EA9238DF71DA50C8D4A1EA50D8D4B49
MQ 21 DATA 1EA949850CA91E850DA9F9A2262061
   26A024888888B91A03C945D0F6B91B03856A
TD 22 DATA CBA9FC991B03B91C0385CCA91C991C
   03A00FB1CB99FC1C8810F8A9868D001DA91E
WH 23 DATA 1D8D011D18A004B1CB69018D881DC8
   B1CB69008D891DA9358DE702A9298DE802EC
RU 24 DATA 60203EF608C99BF005EEF91D286098
   488A48A206B5CB48CA10FAADF91DF0378516
KU 25 DATA CDA9008DF91D85D08DFE02ADF202F0
   26BAADF61DD0038EF61DECF61DD075A96493
SI 26 DATA 85CBA91E85CCD00320FB1DA0FFC8C4
   CDF0F6B1CBC9FFF05B297FD98005D0E9B10D
IR 27 DATA CB10EAC884CEB1CB48C8B1CB486000
   0000223100C8B1CB10FB981869034C3D2282
FF 28 DATA A00084D0A92E998005C884CD84CEA9
   22CDF71DF00BA95585CBA91E85CC4CA52073
OS 29 DATA A5D0D0DCA9801865CD8524A9058525
   A9058522A2F96895D2E830FA68AA68A8A9AA
LZ 30 DATA 9B286020401520271DA9008DF91D60
   FF585846494E442F4026252FB11E254449B6
AK 31 DATA D21F362EC4216344454CAE20A44445
   4C4554C520712ECB21654C4F43CB20752E6B
WW 32 DATA D52165554EAE20A4554E4C4F43CB20
   792ECE21635245AE20A452454E414DC52015
TF 33 DATA 7D4B494CCC20972EC5216545AE20A4
   454E5445D220E32ECC21654C4FAE20A44CAF
QA 34 DATA 4F41C420E32ED2216552554EC4215A
   2ED3216353AE20A4534156C520E32ED82166
SK 35 DATA 634C49AE20A44C495354C4215A4CAE
   20A44C4953D41E252EC22165424CAE20A4D0
QH 36 DATA 424C4F41C4260648454CD02683464F
   524D41D425192ECD21634DAE20A44D4F565B
DM 37 DATA C523E657444FD3249EFF44313A2A2E
   2A9B20B419A9028552A931A004C4CDD003DA
SR 38 DATA AD83058DF81D8D311FA006A93048A9
   1F48A90320D6259810034CBC23206722A93B
NK 39 DATA 008DEE0585D1A97D8DC605A91D8DC7
   05A99B8DC805A9C648A90548A028A909A2A9
AQ 40 DATA 0020D625ADEE05D010A91C8DC6058D
   C705A99B8DC8052056E4207C22A220F81878
CQ 41 DATA A5D1690185D1D82901F00AA9C685CB
   A90585CCD008A9DA85CBA90585CCA5CB48BF
AL 42 DATA A5CC48A014A90520D6259810062OB4
   194C061EEEEE05A00DA920D1CBD097CEEEBC
DY 43 DATA 05A01288B1CBC891CB88D0F7C8B1CB
   C891CBA000A5D129F0D006A92091CBD00968
CV 44 DATA 4A4A4A4A18693091CBC8A5D1290F18
   693091CB4A90C6A9208DD8058DD9054CA23A
NR 45 DATA 1F202D204C061E8DEF05A4CE20EF20
   20C324A5D0F00568684C061EE6CEA220A944
PP 46 DATA 00A4CD9980053898E5CEA818A98065
   CE48A905690048ADEF05C903D002A0042052
MK 47 DATA D6259810066868984CBC2360A921D0
   B1A923D0ADA924D0A9A4CE20EF202056252C
BD 48 DATA F00530074C061EA920D096A90085D0
   4C261EAD4A1E850CAD4B1E850D4C74E4A00B
AG 49 DATA 0020FB1DA4CE88B1CB297F998005B1
   CB3008C820CB20E6CE10EDC8B1CB48C8B11B
PV 50 DATA CB48A4CE608CF005E6CDA4CD88B980
   05998105CCF005D0F4A9209980056OA4CEA5
EK 51 DATA 20EF2020C3244C261E203321ADF71D
   D98005D013C8C8A93AD98005D02F20CB2030
XD 52 DATA A931998005D02520CB20ADF71D9980
   05C820CB20A944998005C820CB20ADF81DC5
DF 53 DATA 998005C820CB20A93A99800560B980
   05C920D020C4CDF01CC6CD8CF005B9810562
UE 54 DATA 998005C4CDF003C810F3A920998105
   ACF00510D960A4CEA920997F05D080E6D0D8
CW 55 DATA A5CDC902F064AD8205C930305DC93A
   105938E920C910D002A9008DF105AD83059A
BB 56 DATA 38E9208DF205C910300AC91A1006A5
   CDC903D00BADF1058DF205A9808DF105A560
AY 57 DATA CB48A5CC4838A558E91285CBA559E9
   0085CCA015B1CBD005A928203D22A9142014
LA 58 DATA 3D22A001B1CBD0096868A90085D04C
   261ECDF205D0E788ADF105297FD1CBD0DDE8
KE 59 DATA C8C8B1CBC900F004C90AD0D1A9208D
   81058D82052CF10530038D8305A0012033F9
IL 60 DATA 21A90B203D22A002202D22A92E2047
   22A9F8203B22A007202D226885CC6885CB2F
FW 61 DATA A90185CE4CA520B1CBF00620542220
   47228810F360C6CC1865CB85CB9002E6CC4A
HV 62 DATA 608D80059848A00020CB2068A86048
   2A2A2A2A2903AA68299F1D632260204000007
IR 63 DATA 6018A55869168DF505A55969008DF6
```

```
   05A9FF8DF7056020A623EEF705AEF705F035
UG 64 DATA 0B8EF805CAD006ADEE05F00160A212
   A028208023CEF805F011A028207E23A000A0
EH 65 DATA 209223A928203D22D0EAA014207E23
   A000209223A212A014209423A003B1CBD031
DG 66 DATA 034C1F23A902203D2238A5CBE9148D
   F305A5CCE9008DF405A212A000208023A2E7
SG 67 DATA 24A028208023202F2320B123A02820
   7E2320A623A00220922320B123A914203D96
SC 68 DATA 22A224A028209423A212A028208023
   A013B98005F003202F23A027A90091588805
RA 69 DATA 10FBA02BA911915860A9008DF90520
   4423ADF905F0016020B12320442360ADF7E5
FO 70 DATA 058DF805A000207E23A200A012C8E8
   E00CF015B98005DD8005300DF0F0A212A04C
PW 71 DATA 28209423EEF90560A028209223A9D8
   203B22CEF805D0CD60A200A9128DFA05B101
YB 72 DATA CB9D8005E8C8CEFA05D0F460A200A9
   128DFA05BD800591CBE8C8CEFA05D0F46010
CU 73 DATA ADF50585CBADF60585CC60ADF30585
   CBADF40585CC6048ADF71DC923F01420B498
HP 74 DATA 1968A2FF9A85B92C41B930034C40B9
   4C34B968A2028E860420E6BD20B4194C06F6
DM 75 DATA 1EA903202D20A59048A59148A9079D
   420338ADE502E5908DFD05A8ADE602E5913D
GS 76 DATA 8DFE0520E52598107CC988D0A9BD49
   038DFE05BD48038DFD0520B419A4CEA931DB
AO 77 DATA D98105D02EA9498DA926A9A9A22620
   BE19A0FF8CFC02CCFC02F0FBADFC028CFC42
HL 78 DATA 02A220C93ED00CA9FF8DFE02A99D48
   A924D00EA4CEA93199810598186980 48A9A3
BX 79 DATA 0548A008A90320D62598309FA59048
   A59148A90B9D4203ACFD05ADFE0520E5258F
UT 80 DATA 9830881007A9D0A22620BE1920B419
   A9008DFE024C061E453AA220ADF81D8DBA40
XR 81 DATA 24A9B948A92448A008A90320D62598
   30B910D944313A444F532E535953A5D0D056
BC 82 DATA 0160A200A98048A90548A4CDA93F99
   8005C8A90B20D62520B419A004A91848A958
QH 83 DATA 2548A90320D625A000A91848A92548
   A90720D62585D0A9CFA22620BE1920B41940
AI 84 DATA A959C5D0D004A90085D0A4CDA92099
   8005604B3AADF81D8D9A26A98E85CBA926C5
SJ 85 DATA 85CCA000A206208023E6D0A01384CD
   20C324A5D0D017A00D207E23E6D0A00E84EF
XN 86 DATA CD20C324A5D0D005A9FE4C27204C06
   1EA6CDA0FF8CFB05A92CC8CAF06FD98005DA
JG 87 DATA D0F7EEFB058888B9800548A9449980
   05B9810548AD8805998105A93A998205E81A
TZ 88 DATA E8E88E4803984820B4196848186980
   488D4403A9006905488D4503A004A9032057
MC 89 DATA D625C0AAF014EEFB05A90B8D4203A2
   002056E4A9DBA22620BE1920B41968A868AB
NB 90 DATA 998105689980 05A92C998205ADFB05
   609D4203C903D006989D4A031009A9009D22
EE 91 DATA 4903989D4803688DC505688DC40568
   9D4503689D4403ADC40548ADC505484C568C
ZL 92 DATA E4A4CE20EF20A210A9008D9E1518A9
   8165CE9D4403A90569009D4503A4CDB97E8B
PQ 93 DATA 05C92FD00EC6CDC6CDB97F05C94ED0
   03CE9E15A4CDA99B99800520A415E000D05A
VB 94 DATA 034C061EE003F00620AA194CBC23A9
   EBA22620BE1920AA194C061E85CB86CCA50B
CT 95 DATA CBA6CC20BE19A0FF08C8B1CBF00E28
   F0EEC99B08E6CBD002E6CCD0EE2860A93F90
IF 96 DATA A2272061264C061E2044FF
YJ 97 DATA ISK DRIVE 1ARE YOU SURE??INSER
   T DISK2;HIT ANY KEY (S=TO SCREEN)!08
ZM 98 DATA OUT OF RAM! ALREADY EXISTS!BAD
    LOAD FILE!7B
RZ 99 DATA 1D1D1D449C
HD 100 DATA ISKIO 4.3 by Bernard Oppenhei
   m!Antic 1/85!Type HELP for commands!CA
FA 101 DATA 007D4313
JF 102 DATA OMMANDS:!!          DIR    Dir
   ectory!          DIRn   Dir. Drive n!
        FORMAT Format disk!            62
EP 103 DATA WDOS    Write DOS.SYS!.X->LI.-
   >LISTD  List to disk!.S->S. ->SAVE    S
   ave to disk!.E->E. ->ENTER  EF1
SF 104 DATA nter to mem.!.L->LO.->LOAD
   Load to mem.!.R->       RUND   Run disk
   file!.K->      LOCK   Lock file!.EB
MB 105 DATA U->UN.->UNLOCK Unlock file!.N
   ->RE.->RENAME Rename file!.D->DEL.->DEL
   ETE Delete file!.B->BL.->BLOAD  BiF4
OD 106 DATA nary load!.M->M. ->MOVE   Mov
   e file!!.R9 runs #9 etc. To use DOS ty
   pe KILL.Reboot to restore DISKIO.!24
MW 107 DATA 00E202E3020D1D47
```

See

**TYPO II**

Page 52

# INFO BITS

See Help.

## *LISTING 2*

```
10 ; LISTING 2
15 ; INFOBITS.ASM
30 ICCOM =     $0342
40 ICBAL =     $0344
50 ICBAH =     $0345
60 ICBLL =     $0348
70 ICBLH =     $0349
80 CIOV  =     $E456
90 PUTREC =    $09
0100 GETREC =  $05
0110 ROWCUR =  $54
0120 CH    =   $02FC
0130 EOL =     $9B
0140 RBLL =    $0358
0150 SBUFL =   $E0
0160 SBUFH =   $E1
0170 SBLL =    $E2
0180 R    =    $E3
0190 RBUF =    $03FD
0200       *=  $0600
0210       PLA
0220       PLA
0230       STA SBUFH
```

continued on next page

```
0240      PLA
0250      STA SBUFL
0260      PLA
0270      PLA
0280      STA SBLL
0290 ;
0300 GET  LDX #$10
0310      LDA #GETREC
0320      STA ICCOM,X
0330      LDA #RBUF&$FF
0340      STA ICBAL,X
0350      LDA #RBUF/256
0360      STA ICBAH,X
0361      LDA #131
0363      STA ICBLL,X
0365      LDA #0
0367      STA ICBLH,X
0370      JSR CIOV
0380      BMI END
0390 ;
0400      LDX #0
0420      LDY #0
0450 P1   LDA RBUF,X
0460 P2   CMP (SBUFL),Y
0470      BEQ P3
0480      CPY #0
0490      BEQ P4
0500      LDY #0
0505      LDX R
0510      JMP P4
0520 P3   INY
0530      CPY SBLL
0540      BCS PRINT
0560 P4   INX
0570      CPX RBLL
0580      BCS GET
0585      CPY #0
0590      BNE P1
0595      STX R
0600      JMP P1
0610 ;
0620 END  RTS
0630 ;
```

```
0800 PRINT LDX #$20
0810      LDA #PUTREC
0820      STA ICCOM,X
0830      LDA #131
0840      STA ICBLL,X
0850      LDA #0
0860      STA ICBLH,X
0870 ;
0880      LDA ROWCUR
0890      CMP #20
0900      BCS PROMPT
0910 ;
0920      LDA #RBUF+$0A&$FF
0930      STA ICBAL,X
0940      LDA #RBUF+$0A/256
0950      STA ICBAH,X
0970      JSR CIOV
0980      JMP GET
0990 ;
1000 PROMPT LDA #MESSAGE&$FF
1010      STA ICBAL,X
1020      LDA #MESSAGE/256
1030      STA ICBAH,X
1040      JSR CIOV
1050 WAIT LDA CH
1060      CMP #255
1070      BEQ WAIT
1072      LDA #255
1074      STA CH
1080      LDA #CLEAR&$FF
1090      STA ICBAL,X
1100      LDA #CLEAR/256
1110      STA ICBAH,X
1120      LDA #5
1130      STA ICBLL,X
1140      LDA #0
1150      STA ICBLH,X
1160      JSR CIOV
1170      JMP PRINT
2000 ;
2010 MESSAGE .BYTE " ANY KEY ",EOL
2015 CLEAR .BYTE "↖",EOL
```

# TECH TIPS

This routine zeroes-out 256 bytes of RAM starting at decimal address ADDRESS:

```
UA 30 ZER=ADR("hh[illegible]")
HR 40 REM X=USR(ZER,ADDRESS)  Zeroes-out
   256 bytes of RAM.
```

This routine performs a double PEEK at decimal address ADDRESS and ADDRESS+1. It's equivalent to: X=PEEK (ADDRESS)+ PEEK(ADDRESS+1)*256

```
RA 50 DBPK=ADR("hh[illegible]")
HT 60 REM X=USR(DBPK,ADDRESS).  Does a do
   uble PEEK at address and address+1.
```

Move NUM bytes from decimal address FROM to address TOO with this handy routine:

```
PY 70 SHIFT=ADR("hh[illegible]")
CJ 80 REM X=USR(SHIFT,FROM,TOO,NUM)  Move
   s NUM bytes from memory location FROM
CO 90 REM to location TOO.
```

POKE 580,1 causes a coldstart when the [RESET] key is pressed. POKE 580,255 returns the [RESET] key to its normal state.

This is a timer routine that will make the computer wait JIFF jiffies:

```
PC 100 JIFF=ADR("hh[illegible]")
IL 110 REM X=USR(JIFF,JIFFIES)  Waits JIF
   FIES
```

This statement quickly fills a string with blanks:

```
WP 120 DIM N$(100)
GK 130 N$(1)=" ":N$(100)=N$:N$(2)=N$
VS 140 REM Quickly fills a string with bl
   anks.
```

NOTE: USR routines are REMmed to guide against potential lock-up. Remove REMs before RUNning.

POKE 65,0 shuts off the beeping you hear during cassette and disk I/O. POKE 65,3 turns it back on again.

POKE 77,129 immediately starts the attract mode.

Send your output to the printer instead of the screen with POKE 838,166:POKE 839,238. Then POKE 838, 163:POKE 839,246 sends your output back to the screen.

# NEW BOOKS FOR ATARI

## Roundup of the Latest Releases

by THE ANTIC STAFF

**Mastering Your ATARI Through Eight BASIC Projects**, edited by Tom Marshall, comes with a disk containing the 13 programs discussed in the book. These programs range from games and music generators to timers and micro-calculators. Every chapter uses one or two of these programs to demonstrate important programming concepts.Unfortunately in many instances, the editor refers to tables and illustrations which do not exist, and asks you to recall facts from chapters appearing much later in the book.

*$19.95. 174 pages. Prentice-Hall, Inc., 200 Old Tappan, Old Tappan, NJ 07675, (201) 767-5000.*

**Basic ATARI BASIC**, by James S. Coan and Rishard Kushner, takes you from an introduction to the PRINT statement to an analysis of Player-Missile Graphics. Beginning programmers should regard this book as a reference tool, rather than a tutorial. It is not easy reading, but the ideas and concepts presented are excellent. The "Bugs in Atari BASIC," section outlines many ways to overcome the language's limitations. Another section examines the special features of the XL Computers, such as enabling fine scrolling through a single POKE statement.

*$15.95. 324 pages. Hayden Book Company, 50 Essex Street, Rochelle Park, NJ 07662, (800) 631-0856.*



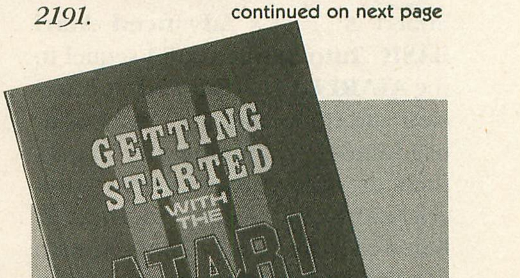

Carl M. Evans's **ATARI BASIC—Faster and Better** shows you how to improve your BASIC programs with machine-language subroutines. The book contains listings and descriptions of more than 80 subroutines, including routines which can make your program unlistable, analyze your program's variables, generate AUTORUN.SYS files and create scrolling screen displays. You don't need to know any machine language to use this book; Evans has translated each assembly listing into DATA statements to use in your BASIC programs.

*$16.95. 300 pages. IJG, Inc. From* ***Antic****, 524 Second Street, San Francisco, CA 94107, (415) 957-0886.*

**Advanced Programming Techniques for your Atari Including Graphics & Voice Programs**, by Linda M. Schreiber, will help you master scrolling, page-flipping, and several other important programming techniques. The book's most helpful chapter, "Working with the Display List," shows you how to create and manipulate customized graphics. The book is easy to read and contains more than 50 type-in programs, including a character set editor.

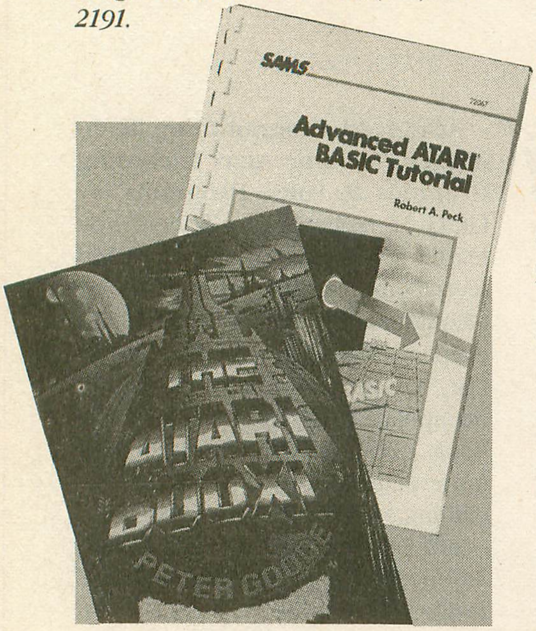
*$14.50. 207 pages. TAB Books Inc., Monterey Avenue, P.O. Box 40, Blue Ridge Summit, PA 17214, (717) 794-2191.*

continued on next page



**101 Programming Surprises & Tricks for your ATARI Computer**, by David L. Heiserman, should provide about 30 minutes of pointless entertainment and frustration for a bored eight-year-old.The book is a disappointing collection of 101 "mystery" programs. You type them in and see what they do. There are calendars, quizzes, mock weather predictions, games. Only some games are programmed to cheat,and there are other "practical joke" programs scattered throughout the book.

*$11.50. 196 pages. TAB Books Inc., Monterey Avenue, P.O. Box 40, Blue Ridge Summit, PA 17214, (717) 794-2191.*




Robert A. Peck's **Advanced Atari BASIC Tutorial**, is a solid sequel to the **ATARI BASIC Tutorial**. It offers clear and comprehensive descriptions of advanced programming techniques such as string manipulation, disk operations and sorting techniques. Featured is a screen builder program to help you create and save your own graphics screens.

*$11.95. 174 pages. Howard W. Sams & Co., Inc., 300 West 62nd Street, P.O. Box 7092, Indianapolis, IN 46206, (317) 298-5400.*

**How to Get the Most Out of CompuServe**, by Charles Bower and Davia Peyton. If you got a CompuServe Starter Kit as a present, or if you're just thinking about maybe becoming a subscriber to this telecommunications information service, get this book. It presents a series of "guided tours" through CompuServe's many layers of menus and commands. The tutorial will save you from wasting considerable time and money as you get familiar with moving around Compuserve.

*$14.95. 275 pages. Bantam Books, 666 Fifth Avenue, New York, NY 10103.(212) 765-6500.*

**The Coming Computer Industry Shakeout: Winners, Losers & Survivors**, by Stephen McClennan. The author is a leading computer stock analyst whose purpose here was to counsel on which high-tech companies to buy shares in and which to avoid. But the book also gives a startlingly frank, no-holds-barred critique of the good points and bad points of just about every important computer-related company. You'll get a kick out of this if you're interested in the computer industry as a whole.

*$19.95. 349 pages. Wiley & Sons, 605 Third Avenue, New York, NY 10158. (212) 850-6500.*

**BASIC on the Atari Computer for Kids**, by Keith and Cherie Wyner, will give you a clear, simple and thorough introduction to BASIC programming. The text and examples are written at a fifth-grade level, but adults willing to study a "kiddie" textbook can expect to learn a good amount of BASIC in very little time.

*$12.95. 213 pages. Howard W. Sams & Co., Inc., 4300 West 62nd Street, P.O. Box 7092, Indianapolis, IN, 46206, (317) 298-5400.*

**Getting Started with Your ATARI 600XL** and **The Atari 600XL Program Book**, by Peter Goode, will help you get the most out of your XL. The Program Book is filled with well-documented type-in games, music programs, and Biorhythm graphings. Just remember that these books were originally published in Great Britain, so the listings substitute the "Pound" sign for our number sign (#).

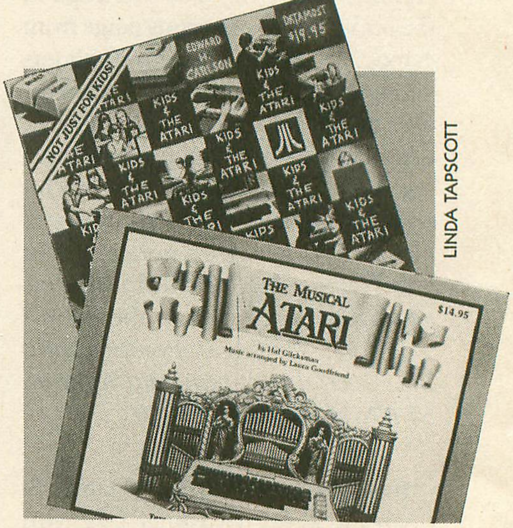
*12.95 each. 150 pages. David & Charles, Inc., Box 57, North Pomfret, VT 05053. (802) 457-1911*

**Kids And The Atari** by Edward Carlson is an excellent choice for adult beginners too, despite its title. Chock-full of brief BASIC samples and clever illustrations, the book is spiral bound for easier program typing. The writing is clear and conversational as it covers the fundamentals of BASIC.

*$19.95. 219 pages. Datamost. From **Antic**, 524 Second Street, San Francisco, CA 94107. (415) 957-0886.*

**The Musical Atari** by Hal Glicksman simultaneously teaches you music and BASIC programming for the Atari's four voices. The book features 29 songs arranged for piano and Atari duets, plus a line-up of sound effects routines. Includes programs for turning the Atari keyboard into a piano or chord organ.

*$14.95. 167 pages. Datamost. From **Antic**, 524 Second Street, San Francisco, CA 94107. (415) 957-0886.*




LINDA TAPSCOTT

## RESTON'S CREATIVE PASTIMES

The best way for most people to learn BASIC is by typing in short programs and experimenting with them. If the programs are accompanied by text that explains them and gives suggestions for alterations, so much the better.

Enter Creative Pastimes, a new series of $6.95 spiral-bound books for beginners from Reston Publishing.

**Homework Helper**, at 149 pages the largest of the series, presents programs for memory skills, spelling and word problems, and history. The "Computer As A Tool" section gives

you programs for using your Atari as a calculator, to paint, plot bar graphs, sort lists, and to learn number systems.

The programs are presented in fully-explained modules, with instructions on how to combine modules for a larger, more powerful program. The book appears to be a translation for the Atari from a version written for some other computer. So it includes a few commands which simply don't work.

**The Code Breakers** (subtitled An Atari Adventure) contains a book-length narrative. Nikki and Adam are a teenage brother-and-sister detective team on the trail of a mystery. Using their computer, they decode clues with your help.

There are only seven short programs in the 75-page book, and none is well explained. However, as an interactive story-program for youngsters, "The Code Breakers" appears to have good entertainment value.

Once the first thrill of novelty has worn off, **41 1/2 Fun Projects For Your Atari** promises to get you interested in playing with your computer again. There's a wide range of programs here, with a solid emphasis on puzzles. In addition, there are plenty of suggestions for modifying the programs to suit your requirements.

The first section, "Word Play," presents the familiar word-search puzzle, word and sentence-scrambling programs. "IQ Building" consists primarily of memory exercises, including a concentration-type game. "Strategy Puzzles" contains the star program of the book, an ancient Japanese game called Dozo with a skillful computer opponent. This game alone is probably worth the price.

The "Music and Noise" section takes advantage of Atari's flexible music-generation capabilities, including a program for tuning guitars and one for tutoring guitar. Finally, "Computer Utilities" provides programs such as "A Calculator Utility," "Decimal/Hex/Binary Conversion," and believe it or not, "A Computer Dating Service"! An appendix accounts for the title's "1/2," and gives 12 suggestions for modifying the book's programs or creating your own.

**Atari Puzzlements** is an interesting experiment. It seems to be intended more for the confirmed debugger than for those who are just learning about BASIC. The book is packed full with very short routines, each of which contains an error of some sort. A line may be scrambled or missing, or program lines may be in the wrong order, or there just might be a tiny mistake in one of the lines. The book's idea is to make you aware of the types of mistakes you make as a beginner, so you'll become more adept at tracking down and solving them. The quality is slightly marred by misleading instructions.

Creative Pastimes has a subcategory of books entitled "Itty Bitty Bytes". Intended for children from ages 6–9, the series attempts to capture children's interest with graphics and sound while teaching them about programming.

All books use the simple, straightforward approach of presenting a short program on one page, with a line-by-line explanation of the program (take-apart) on the facing page. In most cases, it will be necessary for parents to help their children type in and use the programs.

**Itty Bitty Bytes of Space** programs include "Gravity," "Music from Mother Earth," and "Meteors," a simple game. Some **School Days** programs include "Spelling Counts!," "State the States," and the intriguing "Gag Me With a Spoon," which lets you vent your frustration with the school cafeteria. **Matilda, the Computer Cat** contains "Fleas!," "Nine Lives," and "In the Kitty."

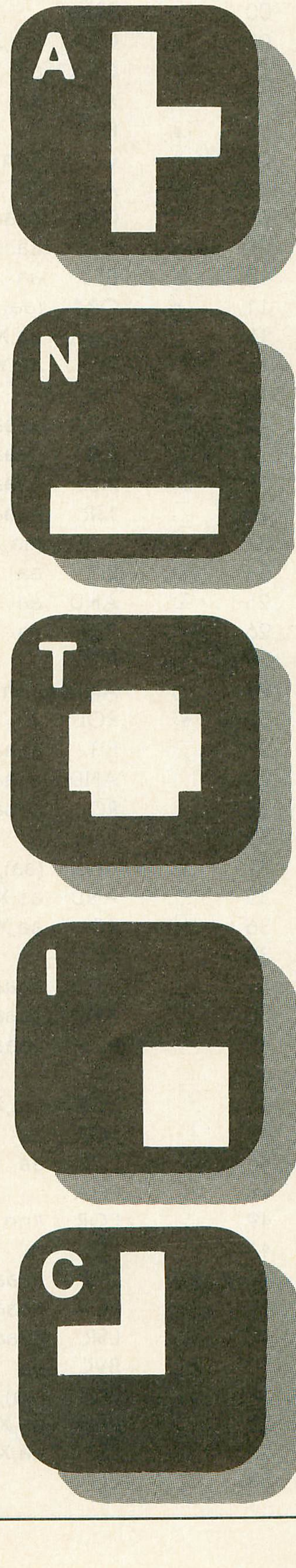
As inexpensive introductions to BASIC programming, the Creative Pastimes series succeeds. Most of the books provide good value and should keep young computerists occupied for hours with a minimum of frustration.

*$6.95 each. Reston Publishing, 11480 Sunset Hills Road, Reston, VA 22090. (800) 336-0338*

# OP CODE FINDER

## Simplifying machine code analysis

by DONNY CHERF




*Opcode Finder is a chart that conveniently brings together the symbols for all three formats of representing machine language subroutines in BASIC programs. This information makes it a lot simpler to hand-disassemble short subroutines for study or modification.*

Once you understand the fundamentals of assembly language programming, a good way to improve your skills is by analyzing existing programs. You can find machine language subroutines in many of the BASIC programs published in **Antic**. To learn how the machine language is being used in the program, you can disassemble these subroutines (convert them back to assembly language).

This job becomes a little harder because there are three possible formats that can be used for representing machine language data in BASIC programs. These formats are:

**Decimal Numbers**

— numbers between 0 and 255 represent specific bytes of machine code.

**Hexadecimal Numbers**

— two characters stand for one byte of machine code.

**ATASCII Characters**

— the ATASCII numerical value of each character in a string represents a byte of machine code.

I put together the following chart so it would be easier for me to hand-disassemble short subroutines, or modify them slightly, without having to load an assembler into my Atari. The chart lists all opcodes (assembly language operating codes) in numerical order—alongside the corresponding hexadecimal values, ATASCII characters and assembly language formats (Alforms).

*Donny Cherf is a computer science major from Merced, California. One of his earlier projects was an Atari version of the Yahtzee game.*

continued on next page

## Decimal and Hex Codes for Instruction Set
## NUMERICAL

| DEC | HX | CHAR | opc | ALform |
|---|---|---|---|---|
| 0 | 00 | ♥ | BRK | |
| 1 | 01 | | ORA | (aa,X) |
| 5 | 05 | | ORA | aa |
| 6 | 06 | | ASL | aa |
| 8 | 08 | | PHP | |
| 9 | 09 | | ORA | #nn |
| 10 | 0A | | ASL | A |
| 13 | 0D | | ORA | aaaa |
| 14 | 0E | | ASL | aaaa |
| 16 | 10 | | BPL | aa |
| 17 | 11 | | ORA | (aa),Y |
| 21 | 15 | | ORA | aa,X |
| 22 | 16 | | ASL | aa,Y |
| 24 | 18 | | CLC | |
| 25 | 19 | | ORA | aaaa,Y |
| 29 | 1D | | ORA | aaaa,X |
| 30 | 1E | | ASL | aaaa,X |
| 32 | 20 | | JSR | aaaa |
| 33 | 21 | ! | AND | (aa,X) |
| 36 | 24 | $ | BIT | aa |
| 37 | 25 | % | AND | aa |
| 38 | 26 | & | ROL | aa |
| 40 | 28 | ( | PLP | |
| 41 | 29 | ) | AND | #nn |
| 42 | 2A | * | ROL | A |
| 44 | 2C | , | BIT | aaaa |
| 45 | 2D | - | AND | aaaa |
| 46 | 2E | . | ROL | aaaa |
| 48 | 30 | 0 | BMI | aa |
| 49 | 31 | 1 | AND | (aa),Y |
| 53 | 35 | 5 | AND | aa,X |
| 54 | 36 | 6 | ROL | aa,X |
| 56 | 38 | 8 | SEC | |
| 57 | 39 | 9 | AND | aaaa,Y |
| 61 | 3D | = | AND | aaaa,X |
| 62 | 3E | > | ROL | aaaa,X |
| 64 | 40 | @ | RTI | |
| 65 | 41 | A | EOR | (aa,X) |
| 69 | 45 | E | EOR | aa |
| 70 | 46 | F | LSR | aa |
| 72 | 48 | H | PHA | |
| 73 | 49 | I | EOR | #nn |
| 74 | 4A | J | LSR | A |
| 76 | 4C | L | JMP | aaaa |
| 77 | 4D | M | EOR | aaaa |
| 78 | 4E | N | LSR | aaaa |
| 80 | 50 | P | BVC | aa |
| 81 | 51 | Q | EOR | (aa),Y |
| 85 | 55 | U | EOR | aa,X |
| 86 | 56 | V | LSR | aa,X |
| 88 | 58 | X | CLI | |
| 89 | 59 | Y | EOR | aaaa,Y |
| 93 | 5D | ] | EOR | aaaa,X |
| 94 | 5E | ^ | LSR | aaaa,X |
| 96 | 60 | ◆ | RTS | |
| 97 | 61 | a | ADC | (aa,X) |
| 101 | 65 | e | ADC | aa |
| 102 | 66 | f | ROR | aa |
| 104 | 68 | h | PLA | |
| 105 | 69 | i | ADC | #nn |
| 106 | 6A | j | ROR | A |
| 108 | 6C | l | JMP | (aaaa) |
| 109 | 6D | m | ADC | aaaa |
| 110 | 6E | n | ROR | aaaa |
| 112 | 70 | p | BVS | aa |
| 113 | 71 | q | ADC | (aa),Y |
| 117 | 75 | u | ADC | aa,X |
| 118 | 76 | v | ROR | aa,X |
| 120 | 78 | x | SEI | |
| 121 | 79 | y | ADC | aaaa,Y |
| 125 | 7D | | ADC | aaaa,X |
| 126 | 7E | | ROR | aaaa,X |
| 129 | 81 | | STA | (aa,X) |
| 132 | 84 | | STY | aa |
| 133 | 85 | | STA | aa |
| 134 | 86 | | STX | aa |
| 136 | 88 | | DEY | |
| 138 | 8A | | TXA | |
| 140 | 8C | | STY | aaaa |
| 141 | 8D | | STA | aaaa |
| 142 | 8E | | STX | aaaa |
| 144 | 90 | | BCC | aa |
| 145 | 91 | | STA | (aa),Y |
| 148 | 94 | | STY | aa,X |
| 149 | 95 | | STA | aa,X |
| 150 | 96 | | STX | aa,Y |
| 152 | 98 | | TYA | |
| 153 | 99 | | STA | aaaa,Y |
| 154 | 9A | | TXS | |
| 157 | 9D | | STA | aaaa,X |
| 160 | A0 | | LDY | #nn |
| 161 | A1 | ! | LDA | (aa,X) |
| 162 | A2 | " | LDX | #nn |
| 164 | A4 | $ | LDY | aa |
| 165 | A5 | % | LDA | aa |
| 166 | A6 | & | LDX | aa |
| 168 | A8 | ( | TAY | |
| 169 | A9 | ) | LDA | #nn |
| 170 | AA | * | TAX | |
| 172 | AC | , | LDY | aaaa |
| 173 | AD | - | LDA | aaaa |
| 174 | AE | . | LDX | aaaa |
| 176 | B0 | 0 | BCS | aa |
| 177 | B1 | 1 | LDA | (aa),Y |
| 180 | B4 | 4 | LDY | aa,X |
| 181 | B5 | 5 | LDA | aa,X |
| 182 | B6 | 6 | LDX | aa,Y |
| 184 | B8 | 8 | CLV | |
| 185 | B9 | 9 | LDA | aaaa,Y |
| 186 | BA | : | TSX | |
| 188 | BC | < | LDY | aaaa,Y |
| 189 | BD | = | LDA | aaaa,X |
| 190 | BE | > | LDX | aaaa,Y |
| 192 | C0 | @ | CPY | #nn |
| 193 | C1 | A | CMP | (aa,X) |
| 196 | C4 | D | CPY | aa |
| 197 | C5 | E | CMP | aa |
| 198 | C6 | F | DEC | aa |
| 200 | C8 | H | INY | |
| 201 | C9 | I | CMP | #nn |
| 202 | CA | J | DEX | |
| 204 | CC | L | CPY | aaaa |
| 205 | CD | M | CMP | aaaa |
| 206 | CE | N | DEC | aaaa |
| 208 | D0 | P | BNE | aa |
| 209 | D1 | Q | CMP | (aa),Y |
| 213 | D5 | U | CMP | aa,X |
| 214 | D6 | V | DEC | aa,X |
| 216 | D8 | X | CLD | |
| 217 | D9 | Y | CMP | aaaa,Y |
| 221 | DD | ] | CMP | aaaa,X |
| 222 | DE | ^ | DEC | aaaa,X |
| 224 | E0 | ◆ | CPX | #nn |
| 225 | E1 | a | SBC | (aa,X) |
| 228 | E4 | d | CPX | aa |
| 229 | E5 | e | SBC | aa |
| 230 | E6 | f | INC | aa |
| 232 | E8 | h | INX | |
| 233 | E9 | i | SBC | #nn |
| 234 | EA | j | NOP | |
| 236 | EC | l | CPX | aaaa |
| 237 | ED | m | SBC | aaaa |
| 238 | EE | n | INC | aaaa |
| 240 | F0 | p | BEQ | aa |
| 241 | F1 | q | SBC | (aa),Y |
| 245 | F5 | u | SBC | aa,X |
| 246 | F6 | v | INC | aa,X |
| 248 | F8 | x | SED | |
| 249 | F9 | y | SBC | aaaa,Y |
| 253 | FD | | SBC | aaaa,X |
| 254 | FE | | INC | aaaa,X |

# Antic® SOFTWARE STORE

Antic powers up your Atari with a fast-growing library of public domain software. These disks and cassettes are packed with outstanding programs created by Atari users all over the world. Antic adds NEW software releases just about every month.

At only $10 each, plus $1.50 per order for shipping and handling, Antic public domain software disks and cassettes are an extraordinary value.

All programs in this series are sold as is. There's no documentation included, except what's built into the programs. Therefore, you may need some expertise in order to use the products properly . . . and there may be some programming quirks you'll need to modify for your individual hardware system. However, all products have been tested at Antic and will perform. Due to unforeseen circumstances, contents may vary slightly from the descriptions here. But each disk and cassette is filled with proven useful programs.

Order today. Send check or money order and product coupon. Allow four weeks for delivery. Use the business reply envelope in this issue or mail your order to: **ANTIC'S SOFTWARE STORE 524 SECOND ST., SAN FRANCISCO, CA 94107**

**NEW**

**ANTIC GAMES DISK #9**
More original games! All new. Never before printed or released in the public domain. Submitted directly to **Antic.**
1. SPACE LIMBO: Space Invaders with a twist.
2. BAY PILOT: Sail the world for treasures while avoiding pirates.
3. TAXMAN: "And you're working for nobody but him."
4. HATS: Mysterious alien hats are invading the earth!
5. ANTIPONG: Do you remember Pong?
6. SPOOK BUSTERS: You must know what this one is about!
7. TYPO TIME: Action game that improves your typing.

## Useful Applications

**ANTIC GRAPHICS DEMO #1**
1. SPIDER: from ANTIC Vol.1, No.3 2. RAINBOW 3. HORSES 4. ATARI logo 5. OXYGEN 6. SPIRAL 7. PRETTY 8. MESSAGE and more

**ANTIC PHOTO GRAPHICS**
**1. DIGITIZED PHOTOS**

**ANTIC GR. & SO. DEMO #1**
1. GRAPHIC 2. DRAW 3. RAINBOW 4. TUNE RITE 5. ETCH SKETCH 6. BABY PRO SOUND and more

**ANTIC MUSIC DISK #1**
Requires Music Composer Cartridge
1. PRELUDE 2. JOPLIN 3. IN MY LIFE 4. STAR TREK 5. DAISY 6. GREENSLEEVES 7. YELLOW SUBMARINE, and many more

**ANTIC MUSIC DISK #2**
Does not require Music Cartridge
1. HARMONIA 2. PIANO 3. STARWARS 4. YOUNG & THE RESTLESS 5. M.A.S.H. 6. CHOPSTIX

**ANTIC UTILITY DISK #1**
1. DOC: program allows you to accompany programs with separate documentation on disk.
2. MICROASSEMBLER: allows you to create USR routines-assembler, more
3. NUM: automatic line numbering utility in BASIC
4. MEMTEST: runs without BASIC cartridge, to test all memory
5. PRINTNOP: connect parallel printer from jacks 3 & 4

**ANTIC UTILITY DISK #2**
1. BUBBLE SORT: from ANTIC Vol. 1, No. 4
2. TYPO: from ANTIC Vol. 1, No. 3
3. HOME INVENTORY
4. RENUMBER 5. COMPARE: listings for differences
6. MODEM 7. RT CLOCK and more

**ANTIC UTILITY DISK #3**
1. DISASSEMBLER: from ANTIC Vol. 2, No. 1
2. TINY TEXT: from ANTIC Vol.1, No. 6
3. GTIA TEXT WINDOW: from ANTIC Vol. 2, No. 1
4. LABEL: disk label on Epson
5. SET UP PRINTER: sets up MX80 for Visicalc

**ANTIC FORTH** **NEW**
A two sided disk containing the fig-Forth language and editor plus a disk tutorial.

**ANTIC BUSINESS DISK** **NEW**
Over 14 business and financial programs including:
1. FINANCE 2. BARGRAPH 3. BANKBALANCE 4. IRA
5. BUSINESS a multi-menu collection of programs
6. IRR 7. SINKFUND

**ANTIC COMPUTER TUTOR** **NEW**
Learning games for youngsters, including:
1. BARNYARD a mystery!
2. FRENCHGAME English/French flashcards
3. MATHWARS 4. CONCENTRATION
5. QUIZ a giant multi-purpose test program.

**ANTIC TELECOMMUNICATIONS** **NEW**
New improved AMODEM plus AUTODIAL system and:
1. TSCOPE 2. DISKLINK 3. AUTOGEN

***Not included in cassette version.**

## Games! Games! Games!

**ANTIC GAMES DISK #1**
1. CHICKEN: a great game from Antic Vol.1, No.1*
2. HANGMAN: the traditional word game
3. CREATION 4. REVERSE 5. MONOPOLY*
6. LUNAR LANDER 7. ZONEX: hidden color patterns
8. CLEWSO: detective adventure

**ANTIC GAMES DISK #2**
1. DEATHSTAR* 2. BLACKJACK
3. CIVIL WAR: a strategic simulation
4. ARTILLERY 5. WUMPUS: text adventure

**ANTIC GAMES DISK #3**
1. PETALS 2. SHOWDOWN*
2. FROG: from Antic Vol.1, No.3 4. DRAW
5. PLUS ZERO 6. COLLISI
7. SPEED DEMON, and more

**ANTIC GAMES DISK #4**
1. VULTURES: Stan Ocker
2. CASTLE HEXAGON: also by Ocker
3. ADVENTURE: the remainder of the disk contains an adventure game which you can play or modify to write your own adventure games.

**ANTIC GAMES DISK #5**
1. BATS: Stan Ockers, once again*
2. STELLAR DEFENSE 3. MASTERMIND
3. HAMMURABI: the classic simulation 4. SLALOM
5. COUCH: analyze yourself 6. ACEYDUCY & MORE

**ANTIC GAMES DISK #6**
1. IMPROVED LUNAR LANDER
2. SUPER WUMPUS SAM, requires S.A.M. cartridge
3. MOONBASE 4. GRAVITY 5. PIG 6. FISH
7. DEFENSE

**ANTIC GAMES DISK #7**
Only 2 games but they take up the whole disk! 
1. HERBIE 4 levels and 4 programs to create them.
2. SMOKEY Text & graphics simulation of a popular movie.

**ANTIC GAMES DISK #8** **NEW**
Never before seen on the public domain circuit. All original games submitted direct to Antic.
1. CALAMITY 2. GRID MASTER 3. JEOPARDY
4. DECODE 5. JUMP KING 6. DIGGER
7. SLAMMER 8. RONI'S TV
9. HIDDEN MEANINGS

**ANTIC MACHINE LANGUAGE GAMES** **NEW**
Fast machine-language action games.
1. "WHIRLYBUG" 2. CREEPSHOW: pinball
3. BLACKHOLE: pinball 4. PASSIONATE: music/graphics demo by Price and Gilbertson

**PLEASE RUSH ME THE FOLLOWING ITEMS. HURRY!**

| | CASSETTE | DISK |
|---|---|---|
| **GAMES #1** | ☐ | ☐ |
| **GAMES #2** | ☐ | ☐ |
| **GAMES #3** | ☐ | ☐ |
| **GAMES #4** | | ☐ |
| **GAMES #5** | ☐ | ☐ |
| **GAMES #6** | | ☐ |
| **GAMES #7** | | ☐ |
| **GAMES #8 NEW** | | ☐ |
| **GAMES #9 NEW** | | ☐ |
| **MACHINE LANG. GAMES NEW** | | ☐ |
| **GRAPHICS DEMO #1** | | ☐ |
| **GRAPHICS & SOUND #1** | | ☐ |
| **PHOTO GRAPHICS** | | ☐ |
| **MUSIC #1** | | ☐ |
| **MUSIC #2** | | ☐ |

| | CASSETTE | DISK |
|---|---|---|
| **UTILITY #1** | | ☐ |
| **UTILITY #2** | | ☐ |
| **UTILITY #3** | | ☐ |
| **FORTH** | **NEW** | ☐ |
| **BUSINESS DISK** | **NEW** | ☐ |
| **COMPUTER TUTOR** | **NEW** | ☐ |
| **TELECOMMUNICATIONS** | **NEW** | ☐ |

_____ DISKS

_____ CASSETTES @ $10 each=$ _____

CA res. add 6½% sales tax _____

+ $2.00 shipping & handling $ _____

TOTAL $ _____

Name_____________________________
PLEASE PRINT

Address___________________________

City_______________ State_____ Zip_______

Make checks payable to ANTIC PUBLISHING

**Phone Toll-Free** . . . for even faster service on Credit Card orders: (800) 227-1617, Ext. 133. In California, (800) 722-3545, Ext. 133

ATARI®

Vastly SUPERIOR to any translation programs available! FOR ATARI 1200XL/600XL/800XL with 64K. (Please specify computer model number!)

ATARI®

**$69.95 (Rom)**
**$49.95 (D or C)**

# THE XL "FIX"! ®

**$69.95 (Rom)**
**$49.95 (D or C)**

The Atari XL series computers represent power, sophistication, and flexibility virtually unrivalled in todays Home Computer Market.

With "approximately" 30-40% of existing software being "incompatable", a real, and serious problem exists. Because of this we have developed THE XL "FIX"!

ADVANTAGES over cheaper "translation products":

1. The XL "FIX"! is capable of fixing more software . . . an estimated **30% more software!**
2. The XL "FIX"! is available in **DISK, CASSETTE,** and now **ROM!**
3. XL "FIX"! versions fix ALL THREE types of software (Disk - Cassette - and Cartridges!)
4. The XL "FIX"! (disk or cassette) adds **OVER 4K** of usable RAM to your computer (anyone using Data bases or Word processors will **really** appreciate this feature!)
5. You never have to hold the OPTION button down on 600XL or 800XL computers!
6. VERY IMPORTANT! You need to load the XL "FIX"! only **once** . . . you can **change** disks, cassettes, or cartridges **without** rebooting the XL "FIX"! each time (disk or cassette)!
7. The **ROM** version is instantaneous upon computer power up, has a high speed cursor, is instantly switchable to your original operating system, will work with 16K 600XL's, and more!

The XL "FIX"! . . . . another SUPERIOR product! **64K required!**

**DISTRIBUTOR/DEALER** inquires welcome

Mastercard-Visa-Money Order or Cashier Check. Phone **(716) 467-9326** Please specify computer model number!

Send $49.95 ($69.95 for Rom) plus $4 shipping and handling (N.Y.S. residents please add 7%) to:
**COMPUTER SOFTWARE SERVICES**
**P.O. Box 17660**
**Rochester, New York 14617**

ATARI®

**THREE NEW PRODUCTS!**

ATARI®

## THE "SUPER PILL"!

Exactly the same as the WORLD'S leading cartridge backup device . . . **THE PILL!** . . . except it's even simpler to operate, it's **SWITCHLESS!** Excellent for families having young children. Totally eliminates opening computer doors and switches. **THE "SUPER PILL"!** is the most advanced state of the **CARTRIDGE BACKUP** device available today. It is totally compatable with all ATARI computers and all programs backed up by the original "PILL"! Only $79.95 plus $4 shipping and handling.

## THE "PROTECTOR/SILENCER"!

The **"PROTECTOR"!** is a disk and hardware modification (no soldering) for Atari 810, 1050, and Indus GT disk drives that will allow you to write true **BAD SECTORS** wherever you wish (not to be confused with ridiculous speed control or tape jerking schemes!). **Powerful** disk program finds hidden directories, scrambles existing directories, fast maps, hex conversions, disk dupes, and much more!

The **"SILENCER"!** quiets your drive tremendously (eliminates the **LOUD** grinding noise when you read a bad sector!), PLUS it allows you to **WRITE TO BOTH SIDES** of any disk **WITHOUT** cutting or notching the disk! Both for only $49.95 plus $4 shipping and handling.

## THE "COMPANION"!

An amazing device that will enhance the capabilities of the **XL "FIX"!** or Atari Translater. It will allow you to **de-select BASIC** (no more need to hold the **OPTION** button while loading programs on the 600XL's and 800XL's), and it will allow you to **de-select the DIAGNOSTICS** (no more bad loads because of the DIAGNOSTICS jumping into the middle of your program load routine!). Installation is simple (10 minutes) and requires NO soldering! Only $29.95 plus $4 shipping and handling.

**DISTRIBUTOR/DEALER** inquiries welcome.

Our other fine products include THE "PILL"!, XL "FIX"!, "IMPOSSIBLE"!, "METAMORPHOSES"!, and "REMOTE"!

Mastercard-Visa-Money Order or Cashiers Check. Phone orders: **(716) 467-9326.** Atari is a TM of Atari Inc. The "METAMORPHOSES"! is a TM of Computer Software Services (division of S.C.S.D., Inc.)

**COMPUTER SOFTWARE SERVICES**
**P.O. Box 17660**
**Rochester, New York 14617**

ATARI®

**$149.95**

For years they said it couldn't be done . . .

# THE "IMPOSSIBLE"! ®

they claimed!

ATARI®

**$149.95**

Backup almost any disk currently available (even **heavily protected** programs) with an **UNMODIFIED** disk drive! Works with **ANY** disk drive!

**PURPOSE:** The **"IMPOSSIBLE"** was developed in response to the estimated half million disk drive users that own a drive other than the Atari 810 (Indus, Percom, Trak, Rana, Astra, etc.) that wish to **BACK UP** their **protected software.** Due to a radically new technology developed by Computer Software Services, modification to your disk drive has been eliminated! The advantages are obvious! Drive warranties are not violated, the chance accidental damage has been eliminated, etc., etc.

**OPERATION:** The **"IMPOSSIBLE"!** consists of a disk program (**unprotected** so you can make as many backups as you wish) and a 4K STATIC RAM pack which is inserted into your computer (no soldering!) The **"IMPOSSIBLE"!** will read your program disk and then **re-write it in an unprotected format!** You may make additional backup copies using a sector copier or even regular DOS! Because your backup copy no longer has BAD SECTORS or EXOTIC FORMATS, the program data can now be manipulated into DOS compatable files (even double density!), transfered to cassette, etc. (with the aid of our Satellite programs!) No user programming knowledge required. A few programs require logical thinking.

**FEATURES:**
1. Backup protected disks
2. Handles most MULTI-LOAD programs
3. Makes DOS files (with Satellite option)
4. Up to 90K data input capable
5. AFSD-Automatic FUZZY Sector Discriminator
6. Expands computer memory to 52K usable
7. Simple NO SOLDER installation
8. Satellite expandable

**PROJECTED SATELLITES:** A **"COMPACTOR"** program which will convert your program into DOS compatable files (double density compatable!) for the storage of several programs on one disk. A **"COLUMN 80"** program for Word Proccessing, etc. It allows 80 columns on the screen! The "XL-MATE" will allow programs made with your 400/800 "IMPOSSIBLE"! to now play on your XL Computer! The **METAMORPHOSES II** program will allow you to convert your **protected CASSETTES** into disk DOS files and vice-versa. All satellite programs must be used with inconjunction with The **"IMPOSSIBLE"!**

**REQUIREMENTS:** The **"IMPOSSIBLE"** diskette, the 4K STATIC RAM pack, a 400 or 800 computer (please specify!) with 48K and "B" Rom's. NOTE! The very old ATARI computers were shipped with "A" Rom's which had some serious "Bugs". Even if you don't own an **"IMPOSSIBLE,"** you should upgrade to "B" Rom's (simple to install!) We have them available at a very inexpensive price. CALL US! "XL" version available soon!

**NOT A PIRATING TOOL:** We at C.S.S. did not design The **"IMPOSSIBLE"!** to put Software Manufactures out-of-business overnight! Nearly all of **our** products have been "ripped-off" by industry parasite who have little or no ability to develop a product of their own so we can sympathize with their dilemma. All C.S.S. products have built-in safe guards which prohibit their use for flagrant pirating. The "IMPOSSIBLE"! is no exception! While The **"IMPOSSIBLE"!** backup the most heavily protected programs, it also checks to see that the 4K STATIC RAM pack is installed before allowing the backup copy to execute!

**EXAMPLES:** The **"IMPOSSIBLE"!** has been tested on 300 of the most popular and heavily protected programs we could find. With nearly 4000 programs for Atari, we DO NOT guarantee that it will backup all programs in the past-present-and future! We will supply updates at $6 each (non-profit!) if and when necessary. Programs we have successfully backed up include: Blue Max, Visi-cal, Archon, Mule, File Manager 800 +, Syn Calc, Syn File, One on One, 7 Cities of Gold, Super Bunny, Load Runner, Drol, and Gumball just to name a few!

Mastercard-Visa-Money Orders or Cashier Check. Phone: **(716) 467-9326** Please specify computer model number!

Send $149.95 plus $4 shipping and handling (N.Y.S. residents please add 7%)

**COMPUTER SOFTWARE SERVICES**
**P.O. BOX 17660**
**ROCHESTER, N.Y. 14617**

# service center

**ALABAMA**

VIDEO REPAIR CO.
2009 CENTERPOINT RD.
BIRMINGHAM
205-854-5212

RAINBOW CITY SERVICE CENTER
244 RAINBOW PLAZA
GADSEN
205-442-6810

C & R ELECTRONICS
704 HOLCOMBE AVE.
MOBILE
205-473-3030

BUSINESS SERVICES
2828 CHESTNUT ST.
MONTGOMERY
205-834-2290

**ARIZONA**

RICK'S TV & APPLIANCE
1104 E. DEUCE OF CLUBS
SHOW LOW
602-537-7625

**CALIFORNIA**

D & G COMPUTERS
4156 MANZANITA AVE. #200
CARMICHAEL
916-485-7779

SAN JOSE COMPUTER
1844-E ALMADEN RD.
SAN JOSE
408-723-2025

B & C COMPUTERVISION
3400 EL CAMINO REAL
SANTA CLARA
408-554-0666

ATCOM COMPUTERS
1421 THOUSAND OAKS BLVD.
THOUSAND OAKS
805-497-1220

AUTHORIZED COMPUTER SERVICE
951 W. FOOTHILL BLVD.
UPLAND
714-985-2101

TESTEK
7224 VALJEAN AVE.
VAN NUYS
818-786-6890

COMPUTER JUNCTION, INC.
15000 7TH ST. SUITE 214
VICTORVILLE
619-245-3622

**COLORADO**

AMERICAN TELEVISION SERVICE CO
1226 W. LITTLETON BLVD.
LITTLETON
303-795-2040

LOOKING GLASS MICROPRODUCTS
4233 WEST EISENHOWER
LOVELAND
303-669-2681

**FLORIDA**

R & S ELECTRONICS, INC.
3245 W. MCNAB RD.
FT. LAUDERDALE
305-979-6763

BOURQUE'S ELECTRONIC SERVICE
180 RICHPIEN RD.
FT. WALTON BEACH
904-862-3346

MR. SOFTWARE
101 HOLLYWOOD FASHION CENTER
HOLLYWOOD
305-981-9090

ENTERTAINMENT SERVICES ELECT.
811 EDGEWOOD AVE. S.
JACKSONVILLE
904-786-1305

COMPUTER IMAGE
10061 SUNSET DR.
MIAMI
305-271-1224

COMP-U-PHONE
6160 EDGEWATER DR.
SUITE E.
ORLANDO
305-291-1712

**GEORGIA**

GOODWIN'S ELECTRONICS
JUNCTION SHOPPING CENTER
ALBANY
912-435-9605

NORMAN'S ELECTRONICS, INC.
4014 PEACHTREE RD. NE
ATLANTA
404-237-3349

ELECTRONIC SPECIALISTS
1685 EDNA PLACE
MACON
912-742-5628

RADIOS AND MICROCOMPUTERS INC.
3833A WASHINGTON RD
MARTINEZ
404-863-9071

HARRIS TV
1 E. MONTGOMERY CROSSROAD
SAVANNAH
912-927-2084

**HAWAII**

KONA COMPUTER
75-5706 HANAMA PL. #107
KAILUA-KONA
808-329-8574

**ILLINOIS**

DIGITAL WORLD, INC.
711 ARMY TRAIL RD.
ADDISON
312-543-9000

OMEGA ENTERPRISES
7823 N. 2ND ST.
ROCKFORD
815-282-1477

**INDIANA**

WRIGHT ELECTRONICS
614 N. MAIN ST.
EVANSVILLE
812-423-2845

CITIZEN'S TV & VIDEO
827 W. GLENPARK AVE.
GRIFFITH
219-924-0047

THE COMPUTER CORNER
7101 BROADWAY
MERRILLVILLE
219-738-3282

**KANSAS**

MIDWEST APPLIANCE SERVICE
METCALF SOUTH MALL
OVERLAND PARK
913-341-6688

**KENTUCKY**

FACTORY ELECTRONICS
2422 PALUMBO DR.
LEXINGTON
606-269-7341

VANOVER TV HOSPITAL
2027 CUMBERLAND AVE.
MIDDLESBORO
606-248-3827

**LOUISIANA**

COMPUTER ELECTRONICS
1955 DALLAS DR.
BATON ROUGE
504-924-8066

**MASSACHUSETTS**

CUSTOM ELECTRONICS
238 EXCHANGE ST.
CHICOPEE
413-592-4761

BEACON TV-ELECTRONICS
8 TILESTON ST.
EVERETT
617-389-8600

CONDOR SERVICE
372 SOUTH MAIN ST.
SHARON
617-784-2382

ROCOM, INC.
184 MAIN ST.
WAREHAM
617-295-2542

**MARYLAND**

NATIONAL BUSINESS & SECURITY
8639 LOCH RAVEN BLVD.
BALTIMORE
301-665-8870

EDGEWOOD TV & AUDIO
4932 EDGEWOOD RD.
COLLEGE PARK
301-441-9116

CROFTON TV & VIDEO SERVICE
2217 DEFENSE HWY
CROFTON
301-721-1700

COMPUVISION COMPUTER CENTER
6445 BURWOOD PL.
GLEN BURNIE
301-850-4055

ADVANCED COMPUTER SERVICE CO.
287 E. GREEN ST.
WESTMINSTER
301-876-8202

**MAINE**

AUTOMATIC SERVICES
22 TARGET INDUSTRIAL CIRCLE
BANGOR
207-942-6769

J.D. ELECTRONICS
385 STEVENS AVE.
PORTLAND
207-775-1411

**MICHIGAN**

FUTURE DIRECTIONS
1520 N. VAN DYKE
BAD AXE
517-269-7211

THE FAMILY COMPUTER CENTER
3895 W. 12 MILE RD.
BERKLEY
313-543-0520

CHASE TRANSISTOR SERVICE
521 LEONARD ST. NW
GRAND RAPIDS
616-454-9000

ABL ELECTRONIC SERVICE, INC.
32 E. 14 MILE ROAD
MADISON HEIGHTS
313-588-6663

SOLID STATE SERVICE
548 SHATTUCK RD.
SAGINAW
517-752-0606

**MINNESOTA**

PHILIPS COMMUNICATIONS & TV
748 N.E. HARDING ST.
MINNEAPOLIS
612-378-7200

USER FRIENDLY COMPUTER
8465 PLAZA BLVD.
SPRING LAKE PARK
612-786-8181

**MISSOURI**

SOUTHLAND ELECTRONICS
22 E. OLIVE DR.
AURORA
417-678-4623

MIDWEST APPLIANCE SERVICE
METRO NORTH MALL
KANSAS CITY
816-436-7010

COMMUNITY SOUND & VIDEO
1834 S. STEWART
SPRINGFIELD
417-887-3391

A & E ELECTRONICS CORP
2001 BIG BEND BLVD.
ST. LOUIS
314-645-7733

J & S VIDEO VISIONS
1051 WASHINGTON SQUARE CENTER
WASHINGTON
314-239-2677

**MISSISSIPPI**

ELECTRONIC SERVICES
2315 25TH AVE
GULFPORT
601-863-3772

**NORTH CAROLINA**

SOUTHERN PHOTO TECHNICAL SVCE
2610 SOUTH BLVD.
CHARLOTTE
704-523-0012

**NEW JERSEY**

DEPENDABLE PARTS, INC.
168 MAIN ST.
CHATHAM
201-635-5888

S R DATA
2141 WOODBRIDGE AVE.
EDISON
201-985-5017

ADVANCED ELECTRONICS
VILLAGE SHOPPING CENTER
RT.206
FLANDERS
201-584-1252

TELSAR ELECTRONIC SERVICES, INC
829 STONE RD.
LAUREL SPRINGS
609-783-8500

VIDEO ELECTRONICS COMPUTER SVC
1418 ROSELLE ST.
LINDEN
201-925-1418

VIDEO CONNECTION OF SOMERSET
900 EASTON AVE.
SOMERSET
201-545-8733

K & S ELECTRONICS
119 HAMILTON BLVD.
SOUTH PLAINFIELD
201-755-4204

**NEW YORK**

ISLAND VIDEO COMPUTER SERVICE
35 MIDDLE COUNTRY RD.
CORAM
515-736-1001

AARDVARK ELECTRONIC SERVICE
44 CASTLE ST.
GENEVA
315-789-5295

LONG ISLAND COMPUTER GENERAL
103 ATLANTIC AVE.
LYNBROOK
516-887-1500

ABC ELECTRONICS SERVICE CO.
392 THURSTON RD.
ROCHESTER
716-328-1840

**OHIO**

ARJAY MICRO
1385 BETHEL RD.
COLUMBUS
614-459-4219

STATION FUN TV, INC.
206 CLINTON ST.
DEFIANCE
419-782-8545

COMPUTER CREATIONS, INC.
KETTERING

B AND G ELECTRONICS, INC.
15729 MADISON AVE.
LAKEWOOD
216-521-2855

ERIC MARTIN'S, INC.
5485 WARRENSVILLE CENTER RD.
MAPLE HGTS
216-663-2032

# service center

VIDEO COMPUTER WORLD, INC.
2223 WOODVILLE RD.
OREGON
419-691-7282

DODD CO.
7795 W. RIDGEWOOD DR.
PARMA
216-886-2828

**OREGON**

NORTHWEST COMPUTER SUPPORT, INC
10200 S.W. NIMBUS G-1
PORTLAND
503-684-3280

**PENNSYLVANIA**

KIBLER'S INDEPENDENT TV
526 FALLOWFIELD AVE.
CHARLEROI
412-483-7484

PARK T. MORROW, INC.
627 W. 26TH ST.
ERIE
814-455-7566

DEBUG BYTES COMPUTERS
662 PHILADELPHIA ST.
INDIANA
412-349-7290

GRUSS ELECTRONIC REPAIR
HILLS PLAZA
JOHNSTOWN
814-266-1395

TESCO, INC.
9237 ROOSEVELT BLVD.
PHILADELPHIA
215-677-5000

NATIONAL TELEVISION SERVICE
5461-63 PENN AVE
PITTSBURGH
412-361-5400

BOYD TV
719 LANCASTER AVE
WAYNE
215-688-3727

**RHODE ISLAND**

VIDEO ENCOUNTERS
MAINES SHOPPING CENTER
WAKEFIELD
401-783-3460

**SOUTH CAROLINA**

ELECTRONIC SERVICE CO.
1736 DECKER BLVD
COLUMBIA
803-782-2705

COASTAL TV & APPLIANCE CO.
603 HWY 501
CONWAY
803-248-2686

**SOUTH DAKOTA**

TAYLOR AUDIO-VISUAL, INC.
1009 DAKOTA S.
HURON
605-352-3205

HOUSE OF TELEVISION
601 SOUTH DULUTH AVE.
SIOUX FALLS
605-338-9051

**TENNESEE**

HI-FI SERVICE CENTER
4608 HIXSON PIKE
CHATTANOOGA
615-877-6781

BILL'S T.V. SALES & SERVICE
3843-C DICKERSON RD.
NASHVILLE
615-865-5000

**TEXAS**

TV CENTER
202 S. WILLIS
ABILENE
915-677-1171

PACIFIC STEREO
525 113TH ST.
ARLINGTON
817-640-3094

LONGS/ENTRONIX
5800 MAPLE AVE.
DALLAS
214-358-3222

COMPUTER HOME, INC.
3548 KNICKERBOCKER
SAN ANGELO
915-944-9795

**UTAH**

INTERWEST ELECTRONICS CORP.
4091 SOUTH STATE ST.
SALT LAKE CITY
801-266-5301

**VIRGINIA**

SALEM COMPUTER CENTER
4034 PLANK RD.
FREDERICK
703-786-8126

VIDEO UNLIMITED SERVICE CENTER
1707 ROUTE 17
GRAFTON
804-898-5318

L & Y ELECTRONICS
13670 JEFFERSON DAVIS HWY.
WOODBRIDGE
703-494-3444

**WASHINGTON**

ON LINE COMPUTERS PLUS
13710 NE 20TH ST.
BELLEVUE
206-644-2080

BUTLER'S TV & COMPUTER SERVICE
28717 PACIFIC HWY SOUTH
FEDERAL WAY
206-941-9096

ARTICULATE SYSTEMS
E 9405 SPRAGUE AVE.
SERVICE CTR
SPOKANE
509-922-0255

JOHNSON'S TELEVISION SERVICE
N 4424 WALL
SPOKANE
509-327-9566

**WISCONSIN**

AUTHORIZED TV
810 NINTH ST.
GREEN BAY
414-499-4215

DAN'S CITY WIDE T.V.
1259 E. JOHNSON ST.
MADISON
608-255-4144

MISTER TV SERVICE
5455 W. BURLEIGH ST.
MILWAUKEE
414-873-2415

**WEST VIRGINIA**

COMPUTERS PLUS, INC.
2077 CHARLESTON TOWN CENTER
CHARLESTON
304-342-4848

Service Centers, Retailers, to get your listing in Antic call (415)661-3400



**THE PARALLEL BUS REVEALED**
continued from page 47

serious about writing professional-level software or designing any kind of hardware for the Atari computer, this manual is a must. As we go along, I'll briefly explain the concepts you need for these articles, but these explanations are not offered as a substitute for the Tech Reference Notes.

## SUMMING UP

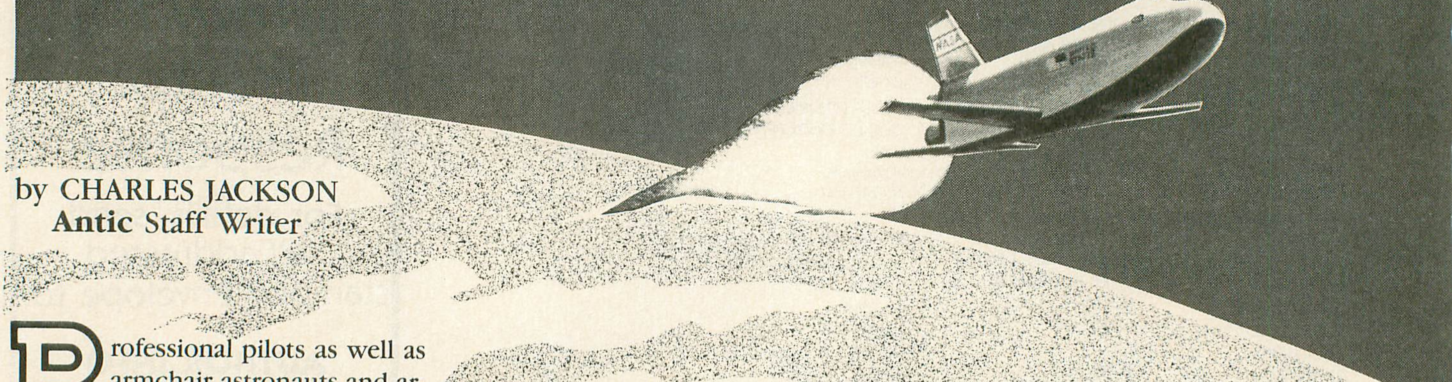
So far we've learned: The OS contains a Generic Handler for parallel devices. It selects one of up to eight devices through a hardware register and keeps track of it through a shadow register. The parallel device has a ROM containing low-level driver vectors (and, perhaps, the drivers themselves) and an INIT routine. During coldstart, the OS will run the INIT routine and the device will declare its existence by writing its bit into the Device Mask and putting its name, along with the Generic Handler's address into HATABS. In operation, the device and the OS communicate through the 6502's A, X, and Y registers plus the Page Zero IOCB. The parallel device cannot use OS Floating Point routines because the device's ROM is mapped into those same locations.

Not too hard, huh? Next month we'll look at hardware requirements, and after that, we'll work up an example and look at interrupts. In the meantime, try to resist the urge to tear off that little cover. We'll explain how to do it safely in the next **Antic**.

*Earl Rice held a number of high-level technical positions at Atari, including head of users group support. His last post there was project leader of the projected top-of-the-line 1450XL computer.*

# NEW ATARI FLI

## Latest Simulation Software



by CHARLES JACKSON
**Antic** Staff Writer

Professional pilots as well as armchair astronauts and arcade aces will enjoy these "uplifting" new programs for the Atari. **Flight Simulator II** and **Space Shuttle** plus **F-15 Strike Eagle** all offer more realism than many "professional" flight simulators.

### SPACE SHUTTLE

Space Shuttle is a home version of the flight simulator used to train shuttle astronauts. You begin your mission in the cockpit 15 seconds before liftoff. Fire your main engines and watch a blue sky fade to black as you pilot the shuttle into orbit 210 miles above the earth. There, you must rendezvous with a satellite and return to earth before running out of fuel.

Your shuttle is equipped with five radar screens, two sets of retro rockets and a mission status board. Use the board to monitor elapsed time, position, speed, fuel level, plus status of your engines, landing gear and payload bay doors.

Programmers Steve Kitchen and Bob Henderson included many special effects. Just after liftoff, you'll see a flash of light and hear your booster rockets fall away from you. During reentry, while plummeting through the electrically-charged upper atmosphere, some of your instruments will temporarily "black out," just as they do during actual shuttle flights. As you near the runway, you'll hear a pair of sonic booms as you pass through the sound barrier. Upon landing, your main tires squeal as the shuttle rolls to a halt at the end of the runway.

Space Shuttle offers three training modes: an introductory level to give you the "feel" of flying the shuttle, a "training" level to sharpen your piloting skills, and the "Mission" level where you must test your skill against the clock and a diminishing fuel supply. I'd recommend this simulation game for ages 10 and up.

### FLIGHT SIMULATOR II

Flight Simulator II is the most advanced flight simulator program available for the Atari. It puts you in the pilot's seat of a true-to-life light airplane, a Piper Cherokee Archer. The program features four-color scenery including mountains, islands, buildings, parks and 80 usable airports. At the start, you're on a runway at Meigs Field near Chicago, facing the Sears building and John Hancock tower. The program also comes with recognizable scenery for Chicago, New York, Seattle and Los Angeles.

Flight Simulator II has an editor that can freeze your position and change any combination of flight conditions, such as altitude, speed, location,

# GHTS

Flight Simulator II
SubLogic Corporation
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
$49.95 38K—disk

Space Shuttle:
A Journey Into Space
Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
$34.95 16K—cartridge

F-15 Strike Eagle
MicroProse Software
10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151
$34.95, 48K—disk



power setting, weather conditions and time of day.

Beginners should be warned that Flight Simulator II is a sophisticated program with very detailed instructions. If you've never piloted an airplane before, your first few days with this software will be filled with stalls and crashes.

Flight Simulator II is not easy to fly. The plane is controlled by joystick plus much of the keyboard. You must press the right cursor arrow key 16 times to advance from idle to full throttle. Press the [5] and [B] keys to look out of the rear window, and repeatedly press the [C] or [M] key to move the rudder.

The program comes with a 92-page book about aeronautics, a 90-page flight manual and pilot's handbook, four flight charts and a double-sided "quick reference" card. Flight Simulator II is not really a game, although it offers a "game" option. The program is actually an excellent training tool which can best be used by student pilots or aviation buffs aged 16 and up.

## F-15 STRIKE EAGLE

Launch into the most exciting aerial combat since **Star Raiders** with F-15 Strike Eagle. Microprose Software has realistically computerized seven sky battlezones over the Mid-East and Viet Nam.

As the pilot of a fully equipped F-15 jet fighter, your first mission sends you into Libya to bomb military airfields and the Libyan Air Command Center. A Libyan Su-22 fires a heatseeking missile toward you as the dogfight begins. Should you need to refuel, you can land on the carrier Nimitz, now patrolling the Mediterranean just off the coast of Libya.

The U.S. Air Force F-15 offers state-of-the-art navigation and weapons systems, including computerized radar and tracking displays, radar jammers, electronic early-warning systems, automatic steering cues, eight supersonic guided missiles, 18 bombs and a 20mm cannon with 1,000 rounds of ammunition.

Your flight instruments, navigation cues and warning signals are projected onto the front windshield. These "heads-up" displays let pilots monitor their instruments while closing on a target. The game is the first flight simulator to include such a display.

The game is controlled by keyboard and joystick. A second joystick may be added to control your throttle and speedbrakes.

F-15 Strike Eagle is an engrossing game which challenges pilots of all skill levels. Beginners will enjoy flying the F-15. Jet aces will enjoy mastering it.

# product reviews

## ROME AND THE BARBARIANS NAPOLEON AT WATERLOO

KRENtek Software
P.O. Box 3372
Kansas City, KS 66103
(913) 362-9267
$34.95 each, 32K—disk or cassette

*Reviewed by Michael Ciraolo*

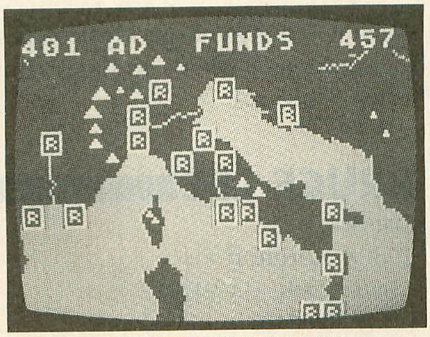
In 476 A.D., the Roman Empire collapsed. Historians argue about the causes—internal bureaucratic problems, poor assimilation of conquered people, failure to withstand the barbarian hordes, etc. Now a game combines these factors with the number-crunching ability of the microcomputer and the Atari's graphics.

**Rome and the Barbarians** looks like a standard military simulation/strategy board game with smooth scrolling and joystick control of the cursor. However, it is not that simple.

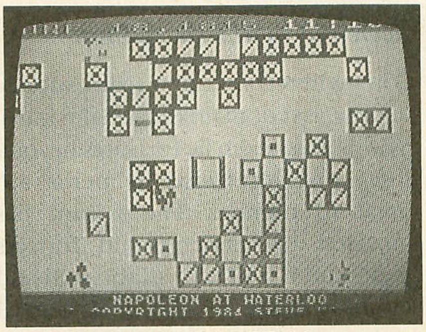
The screen shows the location of Roman units, rebel Romans, invading barbarians, allied barbarians, mercenaries and locals. This game's excellence comes from its realistic understanding of historical issues. The instruction manual warns that "Although Rome and the Barbarians is a military simulation, the strategy must be based on economics."

The economics involved are complex, but not overwhelming. You must consider city tax values, troop payment, your treasury, hiring barbarians, collecting taxes, barbarian tribe loyalty and so on.

Use the joystick to move the large, square cursor over a map of Europe. The map's graphics have nice touches, such as the snow-capped mountains turning brown in the summer. The joystick button determines troop movement. The [SELECT] and [OPTION] keys, pressed when the cursor is over one of the factions, cause the computer to display tax values, troop data and treasury information.



ROME AND THE BARBARIANS



NAPOLEON AT WATERLOO

Documentation is excellent. It includes tips, insight into the game from designer Steve Krenek, historical observations, a map, and tax charts.

The amount of information that must be absorbed to play the game successfully is significant. This adds staying power to the game, but makes it difficult to simply boot up and play. The example and beginner games help.

Combat is attended by the sound of clanking swords. Because of the general lack of sound, this is abrupt and surprising.

**Napoleon at Waterloo** is a more basic version of Rome and the Barbarians. It is concerned with the military strategy involved in deploying forces and fighting. You play against the computer, using the same joystick and smooth scrolling from Krenek's other game. Simpler, shorter, and easier to play, Napoleon resembles the study an artist produces prior to painting a masterpiece. It's a good warm-up to Rome.

## EPIDEMIC

Strategic Simulations, Inc.
883 Stierlin Road, Building A-200
Mountain View, CA 94043
(800) 227-1617, ext. 335 outside CA
(800) 772-3545, ext. 335 in CA
$34.95, 48K—disk

*Reviewed by Jordan Powell*

Are you up for saving the world from a deadly infection from outer space? **Epidemic**, a new simulation game from SSI, allows you just this opportunity.

Meteorites bearing killer alien microbes are headed towards Earth. Your primary defensive weapons are missiles with nuclear warheads for destroying meteorites still in space. You can't hit all of them, though. And once a meteorite hits, the microbes multiply and spread, starting an epidemic. You combat this epidemic with an array of biological and other weapons. As a last resort, you can detonate nuclear devices to destroy entire areas, stopping the disease at the cost of millions of human lives. The goal is to neutralize the disease and stop the spread of epidemics with the least amount of casualties.

As in any good strategy game, you must juggle many variables and interrelated factors. Since you can only accomplish a certain amount in 24 hours, you must allocate your resources wisely. Should you attempt to destroy a meteorite, and if so, which one? Which area of the planet should receive which remedy? You must also deal with uncontrollable meteor impacts and the spread of a disease across geographical boundaries.

A wealth of information is displayed in various forms each turn, but you must know how to interpret it to make the right decisions. Some of the displays take a long time to develop, but they enhance the game by taking advantage of Atari's graphics. For instance, a map of the globe depicts all

continued on next page

# product reviews

areas' current status with various colors and textures. The documentation is a little weak in its description of the displayed data, so you may have to read it a few times and play two or three practice games to understand everything.

A full game can take as long as an hour, but unfortunately, there's no way to save a game in progress. I found Epidemic frustrating to play initially, but as my ability increased the game became much more interesting. If you like games that require thought and the juggling of multiple factors to solve a problem, you'll enjoy Epidemic.

## STAR WARS

Parker Bros.
50 Durham Road
Beverly, MA 01915
(617) 927-7600
$44, 12K-cartridge

*Reviewed by George Adamson*

**Star Wars: The Arcade Game** (Parker Brothers) brings little to the Atari world beyond the appeal of the title. In this adaptation of the movie plot you fly a fighter, firing at other fighters before attempting to destroy the Death Star.

Moving the joystick moves a gunsight; stationary cannons in each corner of the screen fire toward the sight. The poor 3-D effect would have been better if the cannons moved with the sight instead of remaining still.

The appearance of the Death Star is disappointing. It doesn't enlarge to give the illusion of approach. Instead, the screen switches without warning to converging lines representing the trench on the Death Star. There is little impression of movement through the trench.

Star Wars features a standard status line with points, level and remaining shields at the top of the screen. Despite bearing the name of a bestselling movie, this game quickly becomes monotonous and adds nothing to the state-of-the-art.

## BRUCE LEE

Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
(213) 701-5161
$34.95, 32K—disk and cassette

*Reviewed by Harris Shiffman*

Somewhere beneath Earth's surface lies the vast domain of an evil wizard. Within this realm lie treasures beyond imagining, protected by perils too great to number. The wizard has guarded his underground fortress well, and it will take all the skill and cunning of the greatest of all martial artists to prevail.

Welcome to the world of **Bruce Lee**, Datasoft's latest entry into the arcade adventure genre. As Lee, you explore the wizard's underground lair in hopes of finding his treasure. Passage from one chamber to the next is achieved by touching the right combination of lanterns that appear throughout the maze. Your only defenses against the dangers of the caverns are your hands, your feet, and years of athletic training.

There are numerous traps located throughout the many chambers. You'll also need to deal with the wizard's private army, a series of black-robed Ninja warriors and a large green fighter called Green Yamo. Although a few well-placed kicks dispatch these fellows, they're soon replaced. Fortunately, you are a good deal harder to kill than they are.

As an arcade-type adventure game, Bruce Lee represents a middle ground. It isn't as demanding of reflexes and endurance as Shamus and Shamus II, but is more difficult than the elementary Pharoah's Curse (all from Synapse). The background graphics and animation, while not particularly original or innovative, are clean and attractive, and player response to joystick movement is very good.

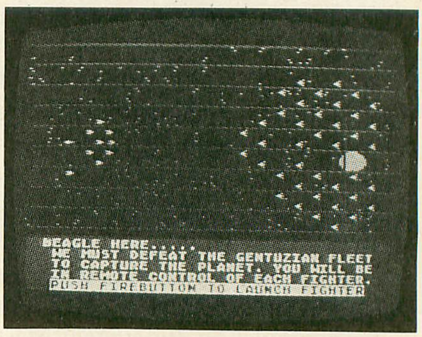
There's one relatively minor flaw. Upon loading the game, a 40-second-long introduction displays Bruce Lee's likeness accompanied by pleasant mood music. It's impossible to cut this short and get on with the game.

Bruce Lee is interesting, challenging, and fun to play. While it could stand an injection of excitement, it is a worthy addition to the adventure maze gamer's collection.

## QUEST OF THE SPACE BEAGLE

Avalon Hill Game Company
4517 Harford Road
Baltimore, MD 21214
(301) 254-9200
$35, 48K-disk-requires BASIC

*Reviewed by Michael Ciraolo*




Like its predecessor, **Jupiter Mission 1999, The Quest of the Space Beagle** combines a variety of arcade games under a uniting theme—your quest to survive, locate the earth and return home.

There are three parts. In the first, your ineffectual robot fighters battle a space armada as you attempt to capture a planet. Then you try to survive in a maze as your air and water repeatedly dwindle. Finally, your patience and memory skills are tested as you search for Earth among all the stars in the known universe. You can't get from one level to another without

completing the first level, although you can save games.

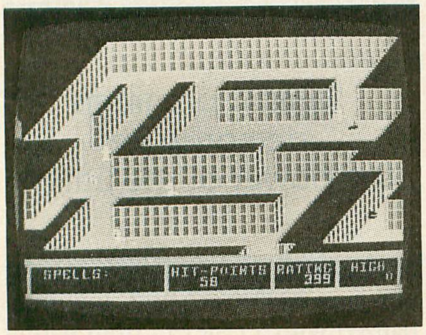
The graphics are fine, but are accompanied by a powerful 60-cycle flickering which is initially distracting and later headache producing.

The second major flaw: there is little incentive to get to the next level, so the game gets boring quickly. You do the same thing again and again. The only reward comes at the end of the game, when you find your way back to Earth. You'll need the attention span of Yoda to succeed.

## REALM OF IMPOSSIBILITY

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
$35, 48K-disk.

*Reviewed by Jack Powell*




A few years ago, a guy named Mike Edwards started to write a football game. Somewhere along the line, the defensive team turned into zombies, spiders and snakes. The playfield twisted and mutated, and the whole thing became a nightmare. Mike called the game **"Zombies"** and a small software company named BRAM, Inc. put it on the market.

The original Zombies had seven dungeons and a total of 74 rooms, with some of the most stylish graphics seen on the Atari. Along came Electronic Arts, the software marketing marvels. They liked Zombies a lot. So, they went to tiny BRAM, Inc. and **Realm of Impossibility** was born.

Realm of Impossibility is Zombies, but changes have been made. Some good. Some bad. The best part of Zombies had always been the incredible dungeon called "The Realm of Impossibility", which was fashioned after the intricate optical illusions of illustrator M.C Escher. Electronic Arts sent Mike Edwards back to his computer to design more of these goodies. The result is six new dungeons and 55 additional rooms for a grand total of 129 rooms filled with snakes, spiders and zombies—plus some unusual beasties called "orbs", which bear a striking resemblance to Oreo cookies.

Some things haven't changed. You're still a tiny, frantic creature, jerking and waving in animated panic. The game has what is referred to as a "two player cooperative mode". This means that two of you can explore these mazes, but you must cooperate and help each other because both of you must leave each room together. If your partner dies, you can resurrect him.

In the old game, you searched each dungeon for one of the seven stolen crowns. In Realm of Impossibility, some of the rooms are locked and can't be entered until you find the keys hidden in the other rooms. This adds somewhat to the texture of the game play. There are also four levels of difficulty which I found to be a vast improvement over the original, which was so hard that I yanked the disk out of the drive and gave up in frustration.

Unlike most computer games, you have no weapons here. You can't kill anyone. Instead, you drop little crosses behind you which temporarily block the pursuers. You also collect spells which, when cast, confuse or freeze all opponents for a brief period. The method of casting a spell, however, is ridiculously awkward. First, you've got to stop moving the joystick. When you've got every monster in the world racing after you, the last thing you want to do is stop. Fortunately, you can simply hit the space bar to cast a spell.

After a while it all becomes the same. It's still too frantic and speedy and little strategy or skill is required. The rooms are marvelous and inventive but they're really nothing more than decorative pathways filled with the same tiny relentless creatures.

## RAILS WEST

Strategic Simulations, Inc.
883 Stierling Road, Building A-200
Mountain View, CA 94043
(415) 964-1353
$39.95, 48K-disk

*Reviewed by Christine Lunardini*

From unexplored, unsettled wilderness to thriving, industrialized civilization in 60 years, this country changed as railroads laced the continent during the 19th century. It was a time of phenomenal growth where personal fortunes were made and lost as entrepreneurs competed to build industrial empires.

**Rails West**, (SSI), is one of the best economic simulations ever presented. Written by historian Martin Campion, Rails West reflects a substantial knowledge of 19th century railroad building. The game allows one to eight players to compete against each other or the computer to build a transcontinental railroad connecting midwest terminals to the west coast. You also compete to build the largest personal fortune.

Rails West is not for the faint of heart. It requires an understanding of free market economics and will challenge your skill as an entrepreneur. To succeed, you must figure out the relationship between issuing stock on the open market, floating bonds, and servicing your debts—while managing to

continued on next page

# product reviews

keep enough of your corporation's stocks to prevent interlopers from gaining control of your road.

You can start the game in 1870, when there was only the skeleton of a rail network, or in 1890 when the roads were in place but ripe for takeover. The novice should gain experience playing the 1870 version first.

Rails West is both an educational simulation and a game of skill. Economic conditions fluctuate from year to year, and there is risk as you move from boom times through fair times to depression. The skill is in knowing when you can safely carry a large debt to capitalize your fledgling road, and when to play your cards closer to the vest with the intention of capitalizing on someone else's misfortune. You need not know about railroads or history to play Rails West, but there is a bonus for those who know something of the times.

Rails West is well worth the effort it takes to learn the rudiments of play. It will make an excellent classroom aid, particularly for group participation, and it is a challenging excursion into the land of robber barons for the individual player.

## ADVENTURES WITH THE ATARI

by Jack Hardy
Reston Publishing
11480 Sunset Hills Rd.
Reston, VA 22090
(800) 336-0338
$14.95

*Reviewed by Jerry White*

If you'd like to start creating your own adventure games, **Adventures With the Atari** is all you need.

This 356-page book includes type-in listings of six different adventure game programs. One text adventure and one graphic adventure are supplied in Atari BASIC, in Microsoft BASIC and in Atari PILOT. These well-written programs are clearly printed for easy reading.

You also get two Atari BASIC programs—The Creator and The Interpreter—that let you design and write your own text adventures by simply filling in data. You can use the program shell to create as many different adventures as you like, as long as each game is stored on a separate disk.

The book also includes adventure maps and flowcharts, as well as a variety of useful programming information. And if you'd rather avoid hours of typing, the author will provide readers with the programs on disk for $12.

My congratulations to Jack Hardy and Reston Publishing on a job well done.

## X-BASIC & SCROLL-IT

SUPERware
2028 Kinghouse Road
Silver Springs, MD 20904
(301) 236-4459
$29.95, disk or cassette
requires BASIC

*Reviewed by Lawrence Dziegielewski*

There appears to be no end of strong new utilities for your Atari. SUPERware has taken some of the trouble out of BASIC programming with two utilities from programmer George Schwenk, **X-BASIC** and **SCROLL-IT**.

X-BASIC extends Atari BASIC by adding several powerful features at an extremely affordable price. The utility adds 30 functions, including string arrays, simplified Player/Missile graphics and sound and memory functions.

X-BASIC is loaded into about 2K of RAM. It is called into action from BASIC through the USR function. Each function is a separate, "pre-programmed" machine language subroutine which the user simply inserts into his own BASIC code. You just use the X-BASIC mnemonic (such as DPEEK for a two-byte PEEK), which is easier to use than the standard convention of doing your own machine language subroutines. Sample programs are included on the disk which demonstrate the power of the utility.

The utility's one major drawback is that extensions must be loaded in every time you want to execute an X-BASIC coded program. One way to avoid this is to save the X-BASIC source with the BASIC source into one load file. But still, this is not as easy nor as convenient as a cartridge.

Schwenk's other utility is SCROLL-IT, a machine language program that allows the user to produce intricate fine screen scrolling without the hassle of extensive programming. A sample program is included with the program to demonstrate the utility's power.

SCROLL-IT is called from your BASIC program. It uses BASIC line

> Sample programs demonstrate the power of the utility.

numbers 29000 to 29199, and is initialized with a USR call from within the program. Before calling in SCROLL-IT, the programmer must define certain variables in the USR call. Once defined, the USR call installs SCROLL-IT and executes it as a Vertical Blank Interrupt. If you have other routines that also execute during VBI, they must be defined and intialized before SCROLL-IT in order for the utility to work properly. Once the utility is in place, you need only POKE the various Page 6 locations to use SCROLL-IT's functions.

Both of these come with adequate documentation, but there is room for improvement. They are not as easy to

use as a cartridge-based language, and assume too much skill of a beginning programmer. Once mastered, however, they make powerful tools.

## MONTANA READING PROGRAM

PDI
95 East Putnam Avenue
Greenwich, CT 06830.
(203) 661-8799
$24.95, 32K-disk
$19.95, 32K-cassette

*Reviewed by Rhonda Holmes*

**The Montana Reading Program** helps improve a child's reading skills. Designed for children from five through eight, the program teaches 220 commonly used words that make up the Dolch list. Successful learning of these words is widely believed to strengthen reading ability.

The concept of moving up in levels helped motivate the kids.

Target words are displayed in simple sentences. After a sentence is displayed, the target word flashes for a short time and is then erased. A box is set in place of the word, outlining the word's basic shape and length. The child is asked to type in the missing word. If the first try is correct, 150 points are tallied on the pinball-style scoreboard. If the child makes a mistake, the computer gives the message to try again. If the child doesn't get it by the third try, the computer proceeds to the next sentence.

Twelve children, between four and eight, who helped me review this program found its graphics and sound captivating. The concept of moving up in levels through continued play helped motivate the kids. Beyond its benefit to reading skills, this program also builds computer and typing skills . . . all increasingly important today.

## ASSEMBLY LANGUAGE PROGRAMMING FOR ATARI

by Mark Chasin
McGraw-Hill Inc.
1221 Ave. of the Americas
New York, NY 10020
(212) 997-1221
$15.95

*Reviewed by Jerry White*

Learning assembly language isn't supposed to be easy, but it just got easier to understand with **Assembly Language Programming for the Atari Computer**.

This readable 304-page book takes you from the fundamentals of AL programming to complex examples that fully utilize the Atari's unique architecture. It is the book to read if you want to learn AL or simply AL subroutines.

You'll learn about Atari hardware, assembler software and legally accessing Atari operating system routines. Routines included teach the use of interrupts, I/O, sound and graphics; the source code for these routines is available on disk for $12.95.

## CHAOS

Touch Stone Software
3213 South 214th East Avenue
Broken Arrow, OK 74014
(918) 258-0222
$29.95, 48K-disk

*Reviewed by Christopher Chabris*

**CHAOS**, the Character Animation Operating System, produces complex animation by combining the concepts of character and Player/Missile graphics.

Like P/M graphics, CHAOS has movable objects and collision registers. However, it also has eight shapes, each composed of four colors and eight-by-eight pixel resolution. Because you're able to use P/M and CHAOS together, you can have up to 16 moving objects on the screen simultaneously.

CHAOS is accomplished through BASIC's PEEK and POKE function. Objects can be moved automatically in four directions at two speeds. The system places an object's coordinates and collision information in registers that your program can read, so your program can activate the motion with a few POKEs and then rest while CHAOS executes the motion every VBI. This is an excellent feature because it frees your program for other processing.

CHAOS consumes nearly 6K of RAM. If you use DOS 2.0, CHAOS, P/M graphics and Atari BASIC, you could have only 23K RAM free. However, CHAOS uses none of the Page 6 memory and is compatible with BASIC XL.

## New Atari Customer Service Phone (408) 745-4851

As **Antic** went to press, we discovered that the Atari Corp. once again has a Customer Service phone number. It's (408) 745-4851—no more toll-free 800 service. And unfortunately the line seems to be busy most of the time.

For the Atari Corp's current service policy, see the previous issue of **Antic** (December 1984, page 6).

# SHOPPER'S GUIDE

# INDUS GT

## $289.95

THE BEST DISK DRIVE - THE BEST PRICE

| | |
|---|---|
| **ATARI**® 800XL Computer | **$189.95** |
| **ATARI**® 600XL Computer | **$119.95** |
| **APE FACE** Printer Interface | **$59.95** |
| **ATARI**® 1050 Disk Drive | **$248.00** |
| **ATARI**® 1030 Modem | **$69.95** |
| **ATARI**® 850 Interface | **$110.00** |
| **BASF** SS/DD Disks - Box/10 | **$17.95** |
| **ASTRA 2001** Dual Disk Dr. w/DOS | **$525.00** |
| **ATARIWRITER**® Word Processing Kit | **$69.95** |
| **SYNTREND, SYNFILE + or SYNCALC** | **$58.00** |

Shipping charges add $2-$5 per order
FREE catalogue of Atari, software and accessories

**(518) 664-4966**

**ABP, Ltd.**
Box 109 MasterCard VISA or C.O.D.
Mechanicville, NY 12118

NOW! UPDATE YOUR ATARI® KEYBOARD WITH

**GRAPH-FIX** KEYBOARD LABELS™

- Convenient
- Saves Time
- Fits All Models
- Improves Accuracy
- 29 Easy-to-Apply Symbols to Label Each Graphics Key

**Mylar-Coated for Long Durability**
**In Stock Now — Shipped Within 24 Hours**
**100% Money Back Guarantee!**

**TO ORDER** send $5.95 check or money order
(Texas residents add 5-1/8% sales tax) to:

**DOVESTAR CREATIVE CONCEPTS**
P. O. Box 2109, Dept. 1015, Nederland, Texas 77627
(409) 727-5978 (No collect calls, please)
MASTERCARD and VISA customers call Toll-Free
1-800-531-7383 (In Texas 1-800-292-5098)
Ask Operator for EXPRESS NUMBER 1037
**DEALER INQUIRIES RECOMMENDED!**

**GIVE YOUR COMPUTER A SET TODAY!**

## FREE SHIPPING

**INDUS GT** .............. **$315**
**ASTRA 2001** - (2 drives in one a must for the serious user) ........... **$519**
**810 Disk Drive** - (New - Surplus our case) ................... **$289**
**RM 1000** (with disk software and cable) exciting - send/receive Morse - RTTY radio modem ............ **$ Write**

## SOFTWARE SPECIALS

**Visicalc - super buy** ......... **$79**
**Letter Perfect** .............. **$69**
**Data Perfect** ............... **$69**
**Pro Business Pkg. all 3** ..... **$199**

**STEWART ELECTRONICS**
**P.O. Box 155**
**Mullin, TX 76864**
Tx. add 5-1/8%

# CRAPS





LEARN AND PLAY THE EXCITING GAME OF CASINO CRAPS— THE INEXPENSIVE WAY

- FANTASTIC GRAPHICS
- JOYSTICK CONTROL
- ONE KEYSTROKE GAME INSTRUCTIONS
- REAL CASINO LIKE PLAY

(ATARI 48K DISK —$24.95 EACH)

SEND CHECK OR MONEY ORDER TO:
**STICK AROUND SOFTWARE**
123 CIMARRON STREET
RICHLAND, WASH. 99352
(509) 627-4914

REALLY *USE* YOUR ATARI!

Q: What's the unpleasant monthly task that could easily be computerized?
A: Balancing the bank statement!

Get CHECKBOOK CHECKER---

*So simple to use, it overcomes spouse's computerphobia.
*Fewer steps than usual--- Let the computer do the work!
*Fully prompted by TV screen.
**Specialized* for home checkbooks.
*Unusual features such as independent adder, to find errors.
*Ideal birthday or holiday gift: Useful---and what a price!

Atari, 32K min., Printer optional.
Disk $9.95 Postpaid
(NJ residents add 6% tax.)

PRINCETON COMPU-CENTER ASSOCIATES
119 Jefferson Rd.
Princeton, NJ 08540

## NEW FOR ATARI 400/800/XL

### PASSWORD ADVENTURE

Explore a magic forest, visit dark caverns, collect valuables, deal with shady characters, enter houses and shacks, open locked chests, dig for clues. . . and solve a **new** mystery in a **different** forest each game! Random generation. All text. **$19.95**

### RETRIEVER DATA BASE

Featuring user-customized records, fast sort in all fields, key-word and list searches, screen and printer outputs with field selection, and easy Add/Amend/Delete functions. Ideal for stamp or book collections, address lists, etc. Adapts to RAM size on board. **$19.95**

Both programs available in 32K disk and 16K cassette version (specify). Cheque. VISA. MC. Dealer discounts available.

**INTER-8**
**502-285 Loretta Ave. South**
**Ottawa, Ontario K1S 5A5, Canada**

# *DISK BREAKS?*

**Fast, Reliable Repair for Atari 810 & 1050 Disk Drives**

- 3 Day Turnaround
- 90 Day Warranty
- $85 Flat Rate with Repairable Exchange

***Dealers—Special Rates Available***
***Ask about Express Expedite***

# *MPS*

The Disk Drive Specialists
***(916) 786-6550***

Add $10 shipping & handling.
Check, MO, Visa, MC

**Attention Atari 810 owners**

## THE "CHIP"

with Archiver/Editor Software 810
Automatic Disk Backup
**$99.95** Post Paid
Available soon for 1050 and Percom Drives

## HAPPY 810 ENHANCEMENT

**$199.95** Post Paid
Includes Warp Drive Package

## ARCHIVER/EDITOR "HAPPY VERSION"

Runs on Disk Drives with Happy 810 Enhancement; makes Happy Drives compatible with The "Chip"
**$39.95** Post Paid
Call or write for free brochure

**Southern Software**
**A division of Southern Supply Co.**
1879 Ruffner Road,
Birmingham, Alabama 35210
Phone 205-956-0986
Prices subject to change without notice.

## ADVERTISERS



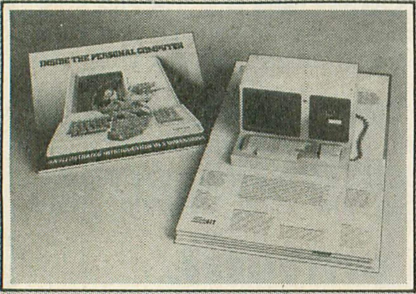
This is provided as a convenience and as a courtesy to advertisers. **ANTIC** does not guarantee accuracy or comprehensiveness.

# new products

## INSIDE THE PERSONAL COMPUTER

(pop-up book)
Abbeville Press, Inc.
505 Park Ave.
New York, NY 10022
(212) 888-1969
$19.95

How do you teach small children—and adults—about computers? The latest passport to computer literacy is an adorable pop-up book that describes and illustrates the workings of a microprocessor, video tube, disk drives and more. Pop-up construction lets you move parts and look inside models. It's a great way to learn, and may intrigue adults more than kids.




## TAC-3

(joystick)
Suncom
260 Holbrook Drive
Wheeling, IL 60090
(312) 459-8000
$14.95

Suncom's latest Totally Accurate Controller features three fire buttons, two on the base and a third on top of the grip-contoured handle. It is solid, responsive and backed by a two year guarantee. The **Antic** staff members who used the TAC-3 were pleased with its performance and excellent construction.

New Products notices are compiled by the **Antic** staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.

## QUEST OF THE SPACE BEAGLE

(game)
Avalon Hill
4517 Harford Road
Baltimore, MD 21214
(301) 254-9200
$35
48K—disk

This is the sequel to **Jupiter Mission 1999**. Like its predecessor, this two-disk game is actually several arcade games held together by a common story line. In the **Space Beagle**, you're lost in a strange galaxy. As you try to get back home, you battle fighter ships, travel the Labyrinths of Kamerra, and eventually explore the entire known universe with allegedly authentic star maps as you search for the Earth.

## POPCOM X100

(modem)
Prentice Corp.
266 Caspian Dr.
P.O. Box 3544
Sunnyvale, CA 94088
(408) 734-9810
$475

One of the hottest new modems, the **Popcom** is an autodial/autoanswer, 300/1200 baud modem with audio monitor and voice-over-data, a feature that allows you to pick up the phone and talk to the person at the other end while your computers are on-line. It is simple to use and automatically adjusts to cabling pinout arrangements and telephone line status—simply plug it in and it's ready. Alas, it doesn't have any status lights.

## PITFALL II: LOST CAVERNS

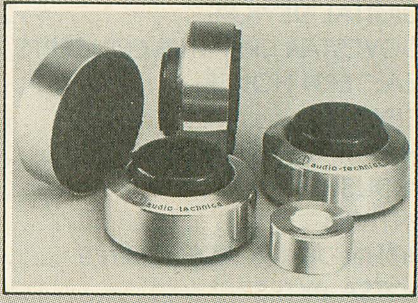
(game)
Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
$32.95
18K—cartridge

Follow Pitfall Harry as he seeks the Raj diamond in the Caverns of the Incas, in this sequel to the best-selling arcade game **Pitfall**.

## INVESTOR'S EXPRESS

(on-line brokerage)
Fidelity Investments
82 Devonshire Street
Boston, MA 02109
(617) 292-7040
$49.95 registration fee, $15/month and 40 cents/minute during peak (7:00 a.m. to 6:00 p.m. weekdays), 10 cents/minute during nonpeak hours.

This service allows you to trade stocks and options, analyze your portfolio and obtain stock quotes with your Atari. You can also display projected dividend yields, review a schedule of capital gains and losses, and follow IRA and Keogh portfolios.




## AT605 AUDIO INSULATORS

Audio-Technica
1221 Commerce Dr.
Stow, OH 44224
(216) 686-2600
$27.95

Found in high-end audio stores, these feet are perfect for reducing the "shake, rattle and roll" caused by printers. The suggested retail price includes four round energy absorbers, each encased in a brushed chrome housing.

*Return the favor. When you call a manufacturer or supplier about a product you've seen advertised or otherwise mentioned in ANTIC, please tell them so. This will help us to continue to bring you the latest information about products that will make your Atari computer an even more valuable investment in the future.* —ANTIC ED




# Put a $20,000,000 Thrill in your Computer!!!






The F-15 STRIKE EAGLE, one of the world's most sophisticated fighters, costs the Air Force more than $20,000,000.00 each. Now you too can strap into your ejection seat and prove how good you really are in exciting modern jet fighter combat. Fly combat missions, engage enemy aircraft, and destroy enemy ground targets from historic missions over Southeast Asia to today's defense of the strategic oil routes through the Straits of Hormuz.

F-15 STRIKE EAGLE (simulator) has all the features that makes the real EAGLE the great fighter aircraft it is — afterburners, multiple radars, air to air missiles, high explosive bombs, cannon, drop tanks, Electronic Counter Measures (ECM) flares, electronic ground tracking maps, Heads Up Display (HUD), outstanding 3-dimensional cockpit visibility, and realistic F-15 maneuverability. Your mission is to take off from your base, fly to and destroy your primary target through all the dangers of enemy territory including Surface to Air Missiles and enemy aircraft. Of course, you have to get back home again, too!!

F-15 STRIKE EAGLE is a very real simulation, accomplished with the guidance of real fighter pilots, and includes seven different combat missions, four skill levels, and an infinite number of exciting scenarios. F-15 will thrill and challenge you and give you the chance to prove you have the "Right Stuff" of an EAGLE fighter pilot!!

F-15 STRIKE EAGLE is available for Commodore 64, ATARI (48K), and Apple II (64K) computers. Suggested retail price is only $34.95. Find STRIKE EAGLE at your local retailer, or call or write for MC/VISA, or COD orders. Add $2.50 for Postage and Handling (Int'l add $4.00USD). MD residents add 5% sales tax.

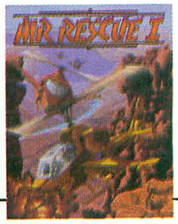
**Experience the reality of these other great simulations from MicroProse**




As close to the Real Thrill of Flying as You Can Handle!!!




Heart Pounding Accelerated Real-Time Defense of Europe Against Soviet Invasion!!!




Sensational Assault Chopper Rescue Raids for Daring Pilots!!!

**MicroProse Software**

**The Action is Simulated — the Excitement is REAL!!**

10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151


Expand Your Atari
MicroPrint
Parallel Printer Interface
MicroPrint
MICROBITS PERIPHERAL PRODUCTS
ALBANY, OREGON
MICROBITS PERIPHERAL PRODUCTS
Works with Atari 400, 800, 600XL, and 800XL
Replaces Atari 850 Interface Module
Compatible with all software
5-foot cable with Centronics plug (compatible with Epson, NEC, Prowriter, etc.)
Connects to serial bus on computer
2 year warranty
225 Third Avenue, SW
Albany, OR 97321
(503) 967-9075
Atari is a registered trademark of Atari Corp. Microbits is not affiliated with Atari. Copyright 1984 by Microbits Peripheral Products, Inc.